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CLINICAL LECTURES

ADDRESSED TO THE

STUDENTS OF THE MIDWIFERY CLASS

AT THE ROYAL SCHOOL OF MEDICINE,

BIRMINGHAM,

BY

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LECTURE VIII.

ON DISEASES OF THE BLADDER IN FEMALES, IN CONNECTION WITH THE UNIMPREGNATED STATE, AND WITH DELIVERY.

GENTLEMEN:—The specimen of disease now presented to your notice was taken from an adult female, whom I had an opportunity of seeing during life. It consists of the bladder, vagina, and rectum, together with a tumour, apparently fibrous, which seems to have originated in the cellular tissue connecting the rectum with the pelvis. The bladder is laid open, its coats being much thickened, and its cavity contracted. There is no appearance of ulceration of the mucous coat generally; but two small fistulous apertures are very perceptible in the cervical portion of the bladder, which communicate with the tumour through the medium of the vagina and rectum. The fluid contents of the tumour, consequently, passed into the bladder. The tumour is not of a malignant nature: it has undergone a process of inflammation and softening, which, at length, implicated the neighbouring organs. The vagina and rectum, however, are healthy, excepting where the fistulous openings have formed. For many months the urine was loaded with morbid secretions, partly from the interior of the tumour and partly from its own inflamed surface, and, after much suffering, the patient died in the greatest degree of emaciation. This constitutes a brief history of the case, which I have laid before you with a view of directing your attention, not only to this but to other affections of the bladder, of a secondary nature, sometimes simulating a primary disease, and leading to consequences of the most serious kind. First, let us consider the effect which fibrous tumours and prolapsed states of the ovarium produce on the bladder. This effect may be purely sympathetic—a mere nervous disturbance, the pain and irritability being extremely severe, even though the urine presents a perfectly healthy character.

The case which formed the subject of my third lecture, was for some time distinguished by great irritability of the bladder; and yet, on a post-mortem examination, that organ was found in a sound state. In further confirmation of these views, I shall briefly mention two middle-aged women, patients of our dispensary, who laboured under symptoms which usually indicate diseased states of the bladder, and which, from the severity of the pain in voiding urine, were believed to arise from calculus; but nothing was detected on introducing the sound. On a subsequent examination I discovered in each patient a small, but exceedingly tender, fibrous tumour, situated on the posterior and superior part of the cervix uteri, and it is remarkable, that in both cases the suffering was confined to the bladder. The symptoms gradually yielded to the mercurial influence. The importance of ascertaining, by internal examination, the condition of the uterus, in cases where the irritation seems to be confined to the bladder, is not at present sufficiently appreciated; but recollect, Gentlemen, that the effects of a disease may be the most acutely felt at a distant part, as in cases of hip disease, and here is an evidence that even a severe affection of the bladder may depend upon a disease in another organ. The examination of the uterus should be made so as to reach the upper part of the cervix, since fibrous tumours constantly form in that situation. But a fibrous tumour may have the effect of producing actual inflammation of the bladder; and then the appearance of the urine will sufficiently characterise this state of the mucous membrane, being opaque, presenting either the gruel, or muco-purulent deposit, or a curdy appearance, like minute portions of lymph mixed sometimes with blood. The appearance corresponds very much with the degree of inflammation. The same condi-

tion of the mucous membrane may arise from the application of a ligature to a polypus. Here is a polypus which I removed by ligature, and on the third or fourth day after its application the bladder became most severely inflamed. The patient vomited, had a very small rapid pulse, intense thirst, and retention of urine. For some weeks afterwards, the urine presented a muco-purulent character, and the woman's life was despaired of; but she ultimately recovered. Here, again, is the uterus, containing only the stem of a polypus. The subject of this case (whom I did not see) died from inflammation of the pelvic viscera, a few days after the application of the ligature. The mucous membrane of the bladder was greatly injected, and presented the starry appearance delineated in the drawing here exhibited.

Verily, Gentlemen, polypoid diseases are not so simple as they are generally held to be, and I know this to be the opinion of some of the most eminent men of the age.

The inflammation may even terminate in open ulceration. A large-sized polypus, for instance, may quite occupy the vagina; or the ovarium, moderately enlarged, may descend behind the pubis and the posterior surface of the bladder, and excite a degree of inflammation which will not only extend to the mucous membrane, but lead to a breach of surface, and allow the fluid contents of the ovarian tumour to enter the bladder. Here is an immensely large polypus, many pounds' weight, which occasioned the death of the patient in the manner I have described. The ulcerated aperture in the bladder is large enough to admit the end of the finger. The inflammation of the mucous membrane continued increasing in severity, and soon occasioned the patient's death.

Having already given the particulars of this case in a paper entitled, "On Fibrous Tumours of the Uterus,"* I beg to refer you to the case, and also to a somewhat analogous case, published by Dr. T. Thompson,† in which a fibrous tumour, by its pressure, produced ulcerative absorption of the bladder; and, although the tumour for some time had the effect of plugging up the aperture, the urine ultimately escaped into the peritoneal cavity, and speedily terminated life. The ovarium, when only slightly enlarged, may be plainly felt at the groin in a person of spare habit, although perhaps a portion of its substance may have descended below the brim of the pelvis, and occasioned much distress. A tumour so situated must almost necessarily consist either of the ovarium or of enlarged lymphatic glands; and the difficulty which may attend the diagnosis will not be removed by an examination through the abdominal coverings, merely. The locality of the tumour—its vicinity to the uterus—its regularity or irregularity of surface—will, together with the history of the case, supply a reasonable presumption as to its true nature. I have already mentioned to you an instance of ovarian dropsy in which the fluid came away by the bladder; and my work on Obstetric Medicine contains a case of neuralgia of the bladder occasioned by the prolapse of the ovary, the pain almost instantly disappearing on the return of the ovary into the abdomen. The work also contains an interesting case of abscess of the ovary, which burst into the bladder, and the tumour could be plainly felt, both at the groin and in the pelvis. The patient recovered, after being greatly emaciated, and enduring many months of suffering, during which time the urine was more or less purulent. About a year ago I visited a lady, in consultation with my friend, Mr. F. Elkington, whose case was parallel to the one just spoken of. A few days after the delivery of her first child, the bladder took on a severe form of inflammation, attended by pain, inability to void urine (which was highly purulent), and irritative fever. On examining the pelvis, we discovered a tumour of an irregular shape, and as large as an orange, excessively tender to the touch, and occupying the right side of the pelvis, between the bladder and the vagina; but it could not be felt over the hypogastrium. It appeared to us that the tumour emptied itself into the bladder, through an ulcerated aperture. Under the employment of the catheter, for about a month, the symptoms nearly ceased, but the urine continued purulent the whole period, and occasionally so for a long time afterwards. I will now describe to you the particulars of the most interesting case of this nature which has yet come before me.

Mrs. —— had been delivered of her first child six weeks antecedent to my first visit. The labour was short and favourable; but the second act of voiding urine was accompanied by pain, which progressively increased, so that at the end of a fortnight her distress was intolerable. The bladder was supposed to have become ulcerated, and I was desired to visit her. The pain in voiding urine, especially at its close, was violent and cutting, and the inclination almost constant. She had considerable pain in the left groin, with tenderness on pressure. The urine was whey-like, and one-third of it consisted of a white curdy deposit, tinged with blood. The pulse was not very frequent. On examination, per vaginam, I discovered a tumour, resembling enlarged glands, occupying the left sacro-iliac junction, and extending to the front of the vagina, directly over the posterior part of the bladder. The tumour seemed to commence opposite to the vaginal portion of the uterus, and was so close upon it as not to present a sensible line of demarcation. It terminated at an

* See "Edin. Med. and Surg. Journal," for January 1, 1840, p. 88.

† See LANCET for 30th March, 1839, p. 58.

inch above the vaginal entrance. Its structure was very firm, and pressure upon it produced very great pain. I placed her under the treatment of calomel and opium, with alkalies, enjoining perfect rest, and a milk diet. She continued progressively improving, and about three weeks after my first visit, on renewing the examination, to my great surprise not a vestige of the tumour remained. It was evident, therefore, that it must have been an ovarian tumour, for under no other supposition can the sudden and entire disappearance of the mass be understoood.

I have now to speak of morbid states of the bladder, produced by causes of an exclusively mechanical kind, namely, pressure during difficult labour. You lately (two of you at least) had an opportunity of seeing a woman a few hours after her delivery by forceps, and I had great apprehension sloughing of the bladder would have taken place. It was a case of impaction. It was impracticable to pass a catheter, and, from the violence of the pains, I feared the womb would give way. It was unsafe to wait. There was barely room to pass the forceps, and this not quite in the proper direction; but, as I could distinguish the pulsations of the fœtal heart, I ventured to use the forceps, for I had only a choice of evils before me. The child was alive when the head was delivered, but delay attended the expulsion of the shoulders, and it was lost. Fortunately the mother did well, the symptoms having been mild. Ere I conclude, I will relate to you the particulars of a similar, but much more striking case, premising some practical remarks on the evils incident upon a heavy pressure of the child's head upon the bladder.

You are already aware of the symptoms by which a state of inflammation and sloughing of the lining of the pelvis is characterised, and I will not repeat them, but merely remind you of the great importance of emptying the bladder in all cases of difficult labour, and especially when the use of instruments is contemplated. The impaction, it is true, may be very close, so much so as to resist the introduction of any kind of catheter. These are extreme cases, and yet two such have presented themselves to my notice within the last month. Supposing the evidence of the extinction of life in the fœtus to be so clear and decisive that perforation be determined upon, there will be no difficulty in passing the catheter after the diminution of the head, and *prior to making any effort at extraction*. Whenever the pressure has been calculated to injure the soft parts, the catheter should be introduced at stated periods after delivery, whether the urine be retained or not, as the most likely means to prevent sloughing. It would be unwise to wait; indeed, the symptoms might not appear until the sloughing had actually commenced; and it is very possible that an involuntary discharge of urine might excite the first feeling of alarm. The practice of leaving the catheter in the bladder for hours together, tends to keep up the existing inflammation, and the apertures in the tube constantly become plugged by thick mucus. Under a severe and long-continued pressure, such, for instance, as occurs in really difficult labours, the urine, when first drawn away by the catheter, usually presents a very dark appearance, and vomiting of a coffee-coloured secretion is sometimes associated with it. On the termination of a labour of this kind, the patient may be left in so exhausted a state as to justify the liberal employment of cordials and stimulants; and, whilst the depression continues, alcohol, ammonia, æther, a low position of the head, the application of heat to the cardia and feet, and a firm support to the abdomen, will constitute our chief resources. On reaction taking place, irritative fever is very likely to ensue, and it is important to bear in mind that the fever originates in local injury, and that the excessive action of the system cannot be subdued by depletion. We can only hope to moderate the symptoms until the natural powers are sufficiently recruited to favour healthy changes and repair the mischief which has already happened. Whatever is calculated to depress local congestion or low inflammation — whatever tends to promote the absorption of effused fluids, or to sustain the system under purulent collections, or during the separation of a slough — ought to be strictly enforced, and almost every thing will depend upon maintaining the powers of the constitution; our object, in fine, should be to allay irritation both general and local, and to support the strength. A very serious practical error is often committed by confounding the rapidity of the pulse, and the abdominal uneasiness and tumefaction, with actual peritonitis. In the event of these symptoms being connected with increased sensibility of the hypogastrium, the inflammatory character of the disease is too readily taken for granted. Although the consequences of a severe labour may extend to the serous membrane, it is generally not so. We find none of the tenderness common to peritonitis, for by keeping the hand for a short time steadily over the abdomen, the sensibility will be found rather to decrease than otherwise; even if the uterus be tender on pressure, it does not follow that the disease corresponds with the pathology of hysteritis. Here the engorgement succeeds a violent delivery, and the disorder is characterised by the symptoms which denote an inflamed state of the cellular tissue. We cannot, under such circumstances, expect that a material reduction of the circulating fluids will conduce to those healthy changes upon which the patient's final recovery must depend. By weakening the action of the heart we deprive the organ of the power of emptying itself (denoted by frequent deep sighing), and whilst this irregular distribu-

tion of blood continues, the nervous energies will become still more depressed. Whenever pain, tenderness, and tension, afford a presumption that the inflammation has extended to the peritonæum, bleeding cannot of course be dispensed with. But accuracy of distinction is highly necessary, and in doubtful cases leeching the hypogastrium is not only safer, but usually more efficacious, than general bleeding. On the due regulation of the intestinal secretions the issue of these cases will also greatly depend; the bowels must be acted upon two or three times in the course of twenty-four hours, by appropriate remedies, such as the infusion of roses, with sulph. of magnesia, or pil hydr. c pulv. rhei, et ext. coloc. co.; or an occasional dose of castor oil, the alvine discharges being promptly disinfected by the chlorides. Turpentine and fœtid enemata are likewise useful, both in dispelling large collections of flatus, and exciting the natural peristaltic action. The abdomen should be rubbed with a stimulating liniment; and, should the sensibility of the system be much impaired, and the abdomen puffy, one part of the oil of turpentine, added to one or two parts of soap, or camphor liniment, is calculated to act beneficially; it is not only a counter-irritant, but reduces the bulk of the abdomen, and acts upon the kidneys. Effervescing draughts, with ammon. carbon, or draughts with camphor mixture, mint water, and comp. spirit of sulphuric æther, or comp. spirit of ammonia, are suitable forms of medicine, and the sedative solution of opium should be given nightly to procure sleep. I must again remind you that after a severe labour it is essential that the bladder should be frequently emptied, and on this point great deception often prevails; if the bladder be *distended* the large ovoid tumour will fully explain its character. But the bladder may, in a great measure, empty itself, and yet some ounces of urine remain, which it has not power to discharge. If this be permitted to continue the retention will become complete, and a state of insensibility with subsultus may be expected to follow. In several instances I have found the bladder greatly distended, and the introduction of the catheter should never be neglected, if only as a precaution. The external parts should be well sponged, and the vagina frequently syringed, by means of an elastic bottle, with tepid milk-and-water, or a tepid decoction of poppy heads, to which, if fœtor prevails, a portion of fresh yeast may be added. If necessary, the lochia should be promoted by fomentations, and poultices applied to the os externum, or heated dry chamomile flowers placed in a flannel bag over the hypogastrium. In order to promote the secretion of milk, the breasts should be emptied as frequently as the strength will permit, the teeth and mouth should be kept free from accumulation, the hands and face sponged with tepid water, the hair cut short, and the temples bathed with a spirit lotion; the room should be well ventilated, the temperature regulated, and the linen, both about the person and the bed, should be changed as often as convenient. These directions, trivial as they may appear, are really calculated to promote the patient's comfort and recovery. The diet during the first two or three days must be restricted to lemonade, whey, and the usual cooling drinks, substituting, as circumstances may indicate, beef-tea, milk, or fresh small-beer. If flatulence prevail, every article either of food or medicine calculated to generate gas should be avoided; plain gruel in small quantities, with the addition of a little warm milk, with a portion of soda water, may be given. As soon as the fever is abated, ammonia and preparations of cinchona, with wine properly diluted, should constitute our main resources. I will now read you the particulars of the case I spoke of.

Case.—Mrs. —— was delivered, after a very difficult labour. Great exertion was employed in the extraction of the head; the perinæum was lacerated, and the recto-vaginal septum was also partially torn. The patient, however, remained tolerably comfortable for two or three days, when the pulse became very irregular and intermitting in frequency, averaging from 140 to 160, in which respect there was no change for at least a week. The abdomen became tumefied and puffy, but was neither painful nor tender to the touch. The intellect wandered, the milk and lochia were diminished in quantity, the former never ceasing altogether at any period, and the latter reappearing now and then but very sparingly. The discharge from the lacerated surface was offensive; the face was deeply flushed, the tongue was dry and covered with a yellow coat, spasmodic twitchings became general, the breathing was quick, the thirst excessive, the lips were covered with sordes, and the apartment was offensive. The bowels were at first torpid, but subsequently both urine and fæces were several times passed involuntarily. The bladder at length lost all its power, and presented a large tumour (not painful on pressure) over the pubes. The catheter was now passed, and two quarts of black urine were drawn off. On the tenth day a most violent perspiration ensued; the cheeks were crimson, the exhaustion became extreme; the patient lay unconscious, and in an apparently dying state. In a few hours, however, an improvement was perceptible, and, after a continuance of the treatment for five or six days longer, the danger was past. Although the patient was unconscious of pain at the time when the bladder was distended with black urine, yet in proportion as she recovered from the fever, a trifling accumulation of urine occasioned great pain, and demanded the use of the catheter during the succeeding

fourteen days, at which time the bladder had nearly recovered its tone, and the urine its healthy qualities. The general treatment was agreeable with the principles already enforced. The recovery of the patient was perfect. In reference to this case, it only remains for me to express my conviction that had lowering measures been resorted to, and the catheter neglected, the result would have been unfavourable. Life might have been spared, but sloughing of the bladder would almost certainly have taken place—an injury generally irreparable. In all such terminations, whilst the patient will have to sustain one of the most insupportable of human afflictions, the practitioner will be exposed to unavailing and abiding regret, perhaps mental anguish, and certainly to loss of reputation. Considerations so powerful and so affecting are eminently calculated to stimulate you to redoubled energy in your endeavours to acquire a correct knowledge of this responsible department of medical science.

COURSE OF LECTURES

ON THE

PHYSIOLOGY AND PATHOLOGY OF THE BLOOD,

AND

THE OTHER ANIMAL FLUIDS,

DELIVERED IN THE SESSION OF 1839-40,

AT THE

School of Anatomy adjoining St. George's Hospital.

BY HENRY ANCELL, ESQ., SURGEON.

LECTURE XV.

Bile.—Lymph.—Fluids of the lymphatic, mesenteric, and thymus glands: Hewson's observations confirmed; Mr. Gulliver's discoveries.—Fluid of the supra-renal capsules.—Menstrual secretion.—Liquor Amnii.—Milk: its cream, casein, sugar, &c. Colustrum: test of its good or bad quality.—Kiestien: detection of pregnancy in doubtful cases. Blood prepared for growth and reproduction.—Nutrition: Schwann and Schleiden's gradation of nutritive fluid; granules, nucleoli, cytoblasts, cells, and tissues.—Diseases of nutrition depend on the blood.

GENTLEMEN:—Some of the fluids separated from arterial blood, and already described, are excretions by which its healthy properties are maintained; others are secretions which serve particular uses in the animal economy. I have now to call your attention to the bile, perhaps the most complex of all the animal fluids derived from blood, differing materially from that contained in any other part of the system, and which may be regarded both as a secretion and an excretion.

Bile.—A fluid of a yellowish-green colour, bitter taste, nauseous smell, readily putrescent, and of a resinous nature. It is found in the liver and in the gall-bladder, the former being of a lighter colour, and the latter, from its containing mucus, and from the absorption of its more fluid part, being more viscid and even ropy. Owing to its variable nature, in no two instances has it furnished, on chemical analysis, any thing like the same results. Its specific gravity varies from 1020 to 1030; it may be mixed with water in every proportion; a minute quantity of free soda gives it an alkaline reaction, which is scarcely visible on test-paper, owing to the intensity of its own colour, but an ounce of thick bile requires about a drachm of acetic acid for its neutralisation; it does not coagulate at a boiling heat; alcohol produces a coagulum, which by some is regarded as salivary matter, and by others as modified albumen; acids produce a flaky precipitate, which is composed of several of its proximate principles; oils are not soluble in it. Viewed under the microscope, according to Müller, it contains whitish or grey particles several times smaller than the blood corpuscles, besides others more minute.

TABLE XXII.

Substances detected in Human Bile by Frommhertz and Gugert.

Water,
Cholesterine,
Biliary resin, }
Picromel, }
Elaic acid,
Colouring matter,
Salivary matter,
Casein,
Osmazome,
Soda and a little potassa:—
Salts of elaic acid, with
——— cholic,
——— stearic,
——— carbonic,
——— phosphoric,
——— sulphuric;
Phosphate of lime,
Sulphate of lime,
Carbonate of lime.

Berzelius regards the biliary resin and picromel as one substance, which he calls *biliary matter*; and Gmelin considers these as the most characteristic principles of bile. Chloride of sodium and many other substances have been detected by different chemists. Its animal principles contain a great proportion of carbon and hydrogen; so that while the lungs separate these elements from the blood, as gas and vapour, in forms resembling the products of combustion, the liver separates the same elements from the blood,

in the form of principles, which are still combustible.

The whole of the blood of the vena portæ, which differs, as already described, from that of any other part of the system, is received by the liver. This viscus is also amply supplied with arterial blood from the aorta. Much difference of opinion has existed as to which of these sources the bile is derived from; but it is now generally conceded that it is mainly if not entirely furnished by the venous blood. Yet, looking to its numerous constituent parts, it is by no means improbable that some of these owe their origin to the systemic blood. With respect to the mucus which is most commonly found in the bile of the gall-bladder, this is certainly the case. The bile, or some of its principles, acts as a stimulus to the peristaltic action of the intestinal canal, and there can be little doubt that it produces some change in the chyme essential to digestion. At the same time, the separation of the constituents of bile, by their elements or in their proper form, from the portal blood, serves to prepare this for its ultimate conversion into arterial blood, during its passage through the lungs. Hence the bile is properly regarded as a secretion (from arterial blood?) which, like the saliva and the gastric juice, serves a special purpose in the process of digestion, and as an excretion which purifies and prepares for assimilation the materials contained in portal blood.

Morbid states of the bile are little known, because it cannot be examined until after death, and at that time very little regard is paid to it. It may be excessive or deficient in quantity, or altered in its sensible qualities. On inspection, bile is found to vary in colour from the deepest black to a transparent white, and in consistence from that of water to that of pitch, and the proportions of its chemical components are equally variable. It is sometimes little else than water and albumen, or its colouring matter, resin, cholesterine, phosphate of lime, or picromel, may predominate, and calculi formed of these substances are frequently formed, the causes of all which circumstances are not only unknown, but they have not been inquired into. That the cause of variations in the composition of bile is to be sought for beyond the liver, has been proved by Magendie: he changed it at will by changing the diet of an animal; but how far the effect is due to a modification of the whole mass of blood, and how far to that of the vena portæ, is not known. Bile obtained from animals after death is sometimes bland and innocuous, at others so acrid as to produce pustules and ulcers wherever applied, and Mascagni gives a case in which it was poisonous. Human bile is sometimes acid.

The excretion of this fluid is frequently prevented by diseases of the ducts and various other causes, and its regurgitation into the blood through the lymphatics of the liver and the thoracic duct may be frequently traced by means of its colouring matter, when the blood becomes surcharged with bile or its constituent principles. In this case the liquor sanguinis becomes excessively yellow, and with this fluid the sclerotica, conjunctiva, skin, urine, sometimes the sweat, bronchial mucus, or saliva—and in those who die of the affection, all the white tissues, except, perhaps, the teeth and the colourless liquids—present various shades of the same hue, constituting jaundice; even the buffy coat is yellow. Stoll, as quoted by Piorry, records the following case:—"A patient, suffering from hypochondriac pains, was bled three times; a buffy coat formed on the blood, at first of a dull, and then of a bright yellow tint; the following day the man had jaundice. This state of the blood frequently occurs in diseases of the liver, and Andral believes it then depends upon non-secretion, and, consequently, a *remora* in the blood of the elements of bile. It may also occur without any destruction of the ducts, or any appreciable disease of the organ; the last-mentioned pathologist examined bodies in which this was the case after jaundice of several months' duration, producing marasmus, and, at length, insensibility and death. Thus the blood may become vitiated, whether primarily or secondarily, by an undue accumulation of those elements or principles which it is the office of the liver to eliminate from it, in the form of bile."

When the blood is thus affected, it sometimes happens that all the functions are performed regularly; and we know it as a fact, that there is nothing very injurious in the yellow colouring principle of the bile, which is that of the blood itself, accumulating therein; moreover, the blood is very readily relieved of it by the kidneys and other organs; but there is a circumstance frequently overlooked—the existence of one is no proof of that of all the constituents of bile in the blood. The unctuous state of the skin, so remarkable in some cases of jaundice, and the green and black hues in other cases, establish the fact that the blood may be vitiated by many of its constituents; but they also establish this, that the term jaundice comprehends various morbid states of the blood, and at the same time they account for differences in its symptoms and results. Andral has remarked somewhat as follows:—The effects of the admixture of the elements of bile with the blood must depend on the state of the organs, and the more or less intimate, complete, prolonged, or abundant admixture of them; thus bilious attacks and bilious fevers, in which all the tissues are tinged as in jaundice, and in which there is a flow of bile upwards and downwards, are very capable of being produced by such a cause.

That the materials of the bile may be formed more abundantly than usual in the blood, or that the liver may fail to separate them, is proved again by the fact, that biliary deposits are found in the parenchyma of various organs, and its resinous substances have been detected in the fluids and solids. Bile added to blood out of the body prevents its coagulation (Table XV. 30); this observation of Hunter has been lately confirmed by Werner.

I have now to recall your attention to those fluids which contribute to the formation of blood. The chyle was treated of in a former part of the course, and at the same time a few remarks were made upon the

Lymph.—This is a transparent, pale, yellowish, inodorous, slightly alkaline fluid, of a saline taste, which traverses the lymphatics. According to the analysis of Leuret and Lassaigne, as procured from the neck of the horse, it was composed of

Water	925.
Albumen	57.36
Fibrin	3.30
Chloride of sodium, ——— potassium, Soda, Phosphates of lime	14.34
	1000.0

Besides which, Tiedemann and Gmelin assert that it contains salivary matter, ozmazome, carbonates, sulphates, muriates, and acetates of soda and potassa, with phosphate of potassa. Müller had the opportunity of examining the lymph from a wound in the dorsum of the foot in the human subject; it exuded constantly, as an inodorous, perfectly transparent fluid, which rendered vegetable blues slightly green, and in about ten minutes formed into a delicate fibrinous coagulum, resembling a spider's web. Viewed under the microscope, Hewson recognised innumerable globules in the lymph, about the size of the nuclei of the blood, and Müller confirmed this observation with respect to the human lymph just mentioned; it contained a number of colourless globules, much smaller and much fewer in number than the red corpuscles of the blood. After coagulation a few of these globules were enclosed in the clot, but the greater number remained suspended in the serum. These globules are now regarded by Schwann, Vogel, and others, as *nucleated cells*. By the action of acetic acid they are rendered more transparent, and a darker nucleus becomes evident in the interior. The concentrated clot consists of a white, fibrous tissue; the albumen of lymph is coagulated by the ordinary reagents. The most decided distinction between it and blood is the absence of hæmatosine; and, with the exception of the circumstance that it contains globules, it is a fluid, as will be seen by the above description, closely analogous to the liquor sanguinis. There is a fact pointed out by Müller which seems to establish something beyond this analogy. When the blood of frogs does not coagulate, as happens when they pass eight days or more out of the water in summer, a coagulum is no longer produced in the lymph.

The precise origin of the lymphatic vessels is unknown. Breschet believes that they always take their rise in the cellular tissue, since the nails, hair, epidermis, and enamel of the teeth, which have no cellular tissue, have also no lymphatics. We are equally ignorant of the origin of the fluid which they contain; but this much we do know, that the lymph is poured into the venous current, mainly through the thoracic duct; the lymph, chyle, venous blood, and substances conveyed through the liver from the intestinal canal, are commingled in the right cavities of the heart and propelled through the lungs, to be converted into arterial blood. Pathology teaches us that the lymph is essential to the formation of arterial blood, and accordingly to nutrition; thus, in diseases of the lymphatic system, when the lymph is extravasated, or obstructed in its course, marasmus is the consequence. The quantity in the vessels has been variously estimated at from one ounce and a half to twelve pounds; this must be founded upon very uncertain data, but evidently it is considerable, and we are unacquainted with the rapidity of its current. Breschet thinks this must be slow, whereas I have somewhere seen a paper, written lately, to prove that it is very rapid.

Lymph varies in its qualities. Owing to the difficulty of procuring it from the small vessels, it is usually obtained from the thoracic duct of an animal killed some hours after a meal; it is then of a rose colour, slightly opaline, of a spermatic odour, saline taste, slightly viscid, sp. gr., 1022 to 1028, coagulable; and, according to Breschet, when the clot is exposed to carbonic acid, it assumes a purple, and in oxygen a bright red colour, like the clot of blood: it would thus appear that lymph becomes more like blood after it has passed through the lymphatic glands, and as it approaches the heart; but on this point, it is remarked by Müller, that since the lymph goes on incessantly increasing, we can easily conceive that it will furnish more fibrin, and become more coagulable in its progress, without admitting the conversion of its albumen into fibrin, in the lymphatic ganglions, of which there is no proof.

Ever since the discovery of this part of the vascular apparatus, an opinion has entertained that modifications of the lymph must influence the development of diseases; but our ignorance of the more important points respecting this fluid in a state of health, serves as an obstacle to any very extensive pathological inferences. Various

fluids and solids have been found in the lymphatic vessels, and these appear sometimes to have been formed there, and at others to have been introduced by absorption. Cases of sanguineous effusion into the peritonæum and pleuræ are on record where the lymphatics were distended with blood; in fact, it is certain that many substances are absorbed from the parenchyma cavities and surfaces, and conveyed with the lymph through the lymphatic vessels: we had an instance in the case of the bile. Andral, Fodera and others, cite instances where the lymphatics proceeding from abscesses contained a fluid resembling pus. Sir A. Cooper witnessed a case of diseased testis in which the lymphatics of this organ, and even the thoracic duct, were filled with a white, brain-like matter. A substance resembling tubercle, and masses of phosphate of lime, have been found in the same vessels. Coloured liquids injected into the pleura or peritonæum of living animals have also been traced through the lymphatics to the thoracic duct. It is also well known that many medicines and poisons, whether generated in the system or applied from without, are absorbed with the lymph. Thus, there can be no doubt that the blood may be vitiated or poisoned through the lymph, and the material cause of diseases, and the active principles of medicines, may be introduced into the vital current by this channel. With respect to the absorption of blood and pus, it must be observed that neither the globules of the one nor the corpuscles of the other can be received into the lymphatic vessels in a state of integrity: it is more than probable that in the cases above referred to, the red liquid consisted of hæmatosine in a state of dissolution, and that the pus was decomposed or dissolved, since the size of its globule is an insuperable obstacle to its absorption in an entire state; or in some cases we may imagine a solution of continuity of the lymphatic vessels. Notwithstanding all this, Mr. Lane and myself have invariably seen imperfect blood corpuscles in the lymph of the larger trunks, that is to say, not only the globules above described, but, as it were, these globules with an imperfect envelope, to which latter we feel inclined to attribute the rose colour of the lymph. T. Marchand has published an analysis of human lymph from a wound on the back of the foot, which would not heal, in which fluid there was only .43 per cent. of albumen.

It appears from Magendie's experiments, that when an animal is starved the lymph first augments in quantity and consistence; it becomes more viscid, more opaline, of a more spermatic odour; and in dogs it takes the peculiar odour of the animal, but after about twelve days it changes its character, and diminishes very rapidly in quantity, so that at the period of death there is very little or none to be found in the thoracic duct.

Fluid of the Lymphatic, Mesenteric, and Thymus Glands.—Hewson paid great attention to the white, thick, mucus-like fluid which had been previously observed by anatomists in the lymphatic glands. He diluted this fluid with serum, as he had previously done the blood for microscopic examination. By this means he detected in it "numberless small, white, solid particles, resembling in size and shape, and some of their chemical relations, the nuclei of the blood corpuscles." A precisely similar kind of fluid was observed by him in the thymus gland. Sir A. Cooper has recently described the latter organ. It is a double conglomerate gland containing cavities, spirally-disposed ropes or tubes, and a reservoir, lined with a very vascular membrane; its veins terminate in the vena innominata, and its peculiar fluid is emptied by them, like the chyle, into the venous blood, near to the heart. It secretes a great abundance of fluid in the early period of life. This fluid, as obtained from the calf, is soluble in warm water; it coagulates by heat and alcohol: sulphuric acid coagulates and chars it; nitric acid coagulates it firmly, first turning it white, and then yellow; diluted nitric acid precipitates a white solid, from its solution in water, giving it the appearance of milk; hydrochloric acid coagulates it firmly, and turns it white. With respect to the latter statement, Mr. Gulliver says, "If a very small quantity of the acid be added to the fluid, there will be precipitation; if the acid be used in excess and mixed with the juice, the precipitate is dissolved, and a transparent ropy matter is formed; this action is constant, and probably peculiar." According to Dr. Dowler's analysis, as published by Sir A. Cooper, 100 parts of this fluid contains 16 of solid matter, composed of albumen, "incipient fibrin," mucus, muco-extractive, a trace of phosphoric acid, and salts, consisting of muriate and phosphate of potassa, and phosphate of soda.

We are indebted to Mr. Gulliver for the most recent investigation of the fluid of these organs. He has confirmed the microscopical observations of Hewson, which tended to establish the identity between that of the thymus and that of the mesenteric glands; but this physiologist has at the same time added materially to our knowledge of the subject. It appears from these investigations, 1. That the particles above mentioned are about 1.4500th of an inch in diameter, but variable from 1.6000th to 1.3000th, and even larger. They are very characteristic in appearance, being granular, as if formed of infinitely minute molecules. They may be preserved in acetic acid, but are dissolved in solutions of neutral alkaline and earthy salts, thus remarkably coinciding with the understood chemical characters of the *nuclei* of the blood corpuscle (*see* LANCET, last volume, page 230, and TABLE XIII). The globules of the lymphatic glands agree

with those of the thymus and mesenteric, except that they are rather smoother, and more pellucid in appearance. 2. A strong solution of the above-mentioned salts combines with the fluid of these glands, and produces a characteristic ropy compound, which is so viscid as to draw out into strings; a circumstance that does not occur with the blood or any other animal fluid, except in the instance of muriate of ammonia and of pus. Thus the microscopical and chemical properties of the juices of the thymus, mesenteric, and lymphatic glands, are peculiar and identical with each other. Mr. G. regards the whole of these organs as "elaboratories for nutrient particles at all ages, in which the materials of nutrition are modified and rendered fit for the purposes of the economy."

Fluid of the Supra-renal Capsules.—All the smaller veins of this organ frequently open into a central venous trunk or sinus; the latter is regarded by Mr. Gulliver as its excretory duct. The blood of these veins, particularly of the trunk, is pervaded by peculiar particles of the secretion of the gland. They are very minute oil-like spherules, but the juice of this gland, when placed on paper, and heat is applied, does not always give a greasy stain, nor do the spherules appear to be soluble in æther. They vary in size from 1.20,000th to 1.6000th, but are most commonly from 1.12,000th to 1.8000th of an inch in diameter. The fluid is perfectly distinct; it is not acted upon by caustic alkalies, nor by muriatic, acetic, nor sulphurous acids, nor even strong sulphuric and nitric acids, the particles remaining entire: thus the renal glands seem to pour a peculiar fluid into the blood, which has a special but unknown use. Mr. Gulliver, moreover, states—"The molecules in question are not unlike the nuclei of many of the minute cellules, found in the organic fluids and young growing tissues, called by Schwann and Schleiden, who believe them to be the germs of cells concerned in the growth of the tissues, *cytoblasts*,"—which will be mentioned more particularly presently.

I have now to describe certain fluids which are peculiar to the female sex, and connected with the reproductive faculty; and, in the first place, the *menstrual secretion*. The monthly separation of this peculiar fluid from the blood is essential to the health of the unimpregnated female, of perfect organisation, during a considerable period of her existence. According to M. Denis, it is composed of—

Water	825.00
Corpuscles	64.40
Albumen	48.30
Extractive matter	1.10
Fatty matter	3.90
Salts	12.00
Mucus	45.30
	1000.

Hence, containing no fibrin, it never coagulates, but it forms a grumous mass, usually of a dark red colour, and of a peculiar odour. Remak has ascertained that the intensity of its colour depends upon the number of blood corpuscles; and at the beginning and towards the end of flowing, where it is pale and whitish, it contains a preponderating quantity of the laminæ of the epithelium, and of mucous globules, but the latter are proportionately less, as the fluid presents more blood corpuscles and a deeper colour. The quantity of this secretion and the period during which it flows, are extremely variable in different constitutions; it has been stated at half an ounce to five ounces or more, but in some females a very small portion indeed seems to be compatible with good health; its eruption is frequently preceded by well-marked and well-known general symptoms, which, on analysis, gives encouragement to the opinion, that some periodical change takes place in the blood in the female constitution. It may be suppressed, excessive or vitiated, and these modifications perhaps more frequently depend on morbid states of the blood, than upon affections of the secreting organ; thus chlorosis, anæmia, those disorders of the general health, attended by loss of colour in the countenance, as described by Dr. Hall, and those diseases generally in which a deficiency of the corpuscular part of the blood occurs, are attended by a failure of this secretion. It is extremely liable to fail also in the diseases of organs connected with *hæmatosis*, as in phthisis. On the other hand, modifications of the menstrual secretion, produced by a diseased state of the organ, may be followed by ulterior effects through the blood; its sudden or prolonged suppression may be followed by the most serious state of general ill health; its excess may produce the most extreme exhaustion. A case has been lately recorded in which its sudden but continued suppression from a fright was followed by an alteration of the nutritive process—all the soft parts becoming hypertrophied; it is sometimes acrid and offensive; and that it derives these properties from the blood, is proved by the halitus and cutaneous secretions of the same individuals partaking of analogous qualities. It is most frequently vitiated by an admixture of blood, constituting metrorrhagia. That the menstrual secretion is an essential, and not, as it were, an accidental change produced in the blood of the female, is proved by the fact that, when accidentally suppressed, the other secretions are liable to be altered in quality, and we have what are called vicarious menstrual discharges from the breasts, eyes, mouth, stomach, bowels, &c. A case is frequently quoted from Baudelocque of a female, aged 48, who, from 15 years' old, had an attack of vomiting and purging monthly for three or four days, and who

never menstruated. Sir A. Cooper has remarked that ulcers are very liable to secrete a sanguineous fluid during amenorrhœa, to which he has applied the term menstrual ulcer: that these discharges are menstrual, rests upon the evidence of their peculiar appearance and characteristic odour; but since none of the capillaries, except those of the uterus, allow the blood corpuscles to exude, I should expect, if viewed microscopically, that they would be found *absent* in the above instances.

Liquor Amnii.—Dr. Rees has analysed several specimens with great care. It is a strictly albuminous or serous fluid; specific gravity about 1.007 or 1.008. The following is the mean composition of two cases at 7½ months:—

Water	986.8
Albumen (traces of fatty matter)	2.8
Salts soluble in water	3.7
Albumen from albuminate of soda	1.6
Salts soluble in alcohol	3.4
Lactic acid—Urea	1.7
	1000.0

The salts consist of chloride of sodium and carbonate of soda, with traces of alkaline sulphate and phosphate. In two specimens phosphate of lime was clearly detected, and the albumen yielded a trace of oxide of iron; the fatty matter differed from that of the blood, in not assuming a deep purple tint when digested in strong sulphuric acid, and the flocculi of this liquor were composed of caseous matter containing cholesterine.

The liquor amnii varies greatly in proportional constitution in different individuals, at the same period of utero-gestation, which shows that it is affected by the temperament, diathesis, blood of the mother. The experiments of Dr. Vogt, of Bern, seem to indicate great variation in its density at different periods of utero-gestation. That chemist found 20.55 solid parts in a 1000 at 3½ months, and only 9.71 parts at 6 months, but his results require confirmation. Lassaigne and Dr. Granville assert that air is contained in this fluid.

Milk.—This fluid is secreted from the extreme branches of the mammary arteries ramifying in the milk cells. We have no comparative analysis of the venous blood returning from these organs, but obviously it must differ, during lactation, from the venous blood in any other part of the system. Human milk, like that of the cow, when first drawn separates into a fine vapour or halitus, and a liquid. The former has been described as containing peculiar animal principles, but very little is known about it. The latter has a specific gravity of 1.035, and contains about 12 per cent. of solid matter; according to M. Donné it is uniformly alkaline, the opinion of its being acid having arisen from not examining it immediately after it is drawn; it has a sweetish and also a saltish taste, it is more blue than that of the cow, and like it separates on standing into two parts, viz., skim-milk and cream. Viewed microscopically, it is composed of *globules*, swimming in a liquid. These globules are of various sizes, but most frequently about half the diameter of the blood corpuscle, perfectly spherical, with regular borders (Table XXI. fig. 22). Being lighter than the liquid they rise to the surface in about 24 hours, and by crowding together constitute the cream; they may be separated by filtering several times, are soluble in æther, and, according to Sir A. Cooper and Dr. Bird, are soluble in potassa; but M. Donné had previously asserted that concentrated ammonia has no effect on them, and that they dissolve with great difficulty in caustic solutions of potassa and soda. These globules are believed to constitute the butter; but it is generally stated by the authors to whom I have referred, that human milk frequently contains no butter—the question naturally arises, What is the state of the fluid as regards the globules in these instances?

Cream.—This is composed of the *butter*, a chemical compound, which furnishes stearine, oleine, butyrine and a colouring matter, and a fluid called butter-milk, containing caseum and whey, presently to be described. Its specific gravity is about 1.021, and it varies in proportion to the skim-milk from one-eighth to one-third part; according to Berzelius the cream of cow's milk contains 45 parts of butter, 35 caseum, and 920 of whey, in 1000 parts. I am not aware of any accurate analysis of the component parts of human milk.

Skim-milk.—Instead of being white and opaque like that of the cow, it is translucent; after 10 days or a fortnight, but not so soon as the latter, it again separates into two parts, a solid curd, and a liquid whey. This change is produced by the development of lactic acid.

The curd, Caseum.—The curd well washed with water is considered to be this substance in a state of purity. It is one of the most characteristic principles of milk, and has been regarded as a modified fibrin or albumen. It is white, insipid, and inodorous, insoluble in water, soluble in alkalies and strong acids, coagulable by weak acids including the acetic, not coagulable by heat, and when evaporated to dryness it forms a diaphanous mass resembling gum, and may be long preserved without change. Caseum differs from gum, and also from albumen, in the nature of the spontaneous changes to which it is subject. It is composed of carbon 59.78 + hydrogen 7.42 + oxygen 11.40 + nitrogen 21.33, and it yields a white ash on incineration amounting to 6.5 per cent., composed of phosphates

of lime and magnesia, and pure lime. Human milk has a smaller proportion of caseum than cow's milk.

Whey.—This is the liquid remaining after the separation of the caseum or curd. I have no analysis before me of human milk, but the skim-milk of the cow, of the specific gravity 1033, afforded Berzelius—water, 928.75 + caseum with traces of butter 28 + sugar of milk 35 + chloride potassium 1.70 + phosphate potassa .25 + lactic acid, lactate of iron, and acetate of potassa 6. + earthy phosphates .30, in 1000 parts. Human milk is said to contain also hydrochlorate of soda and of lime, and even sulphur. The most characteristic principle of whey is its *sugar*. This may be obtained by evaporating the whey to the consistence of a syrup, and cooling. It is less sweet, and does not so rapidly undergo the vinous fermentation as cane sugar. By digestion with certain animal products, it has the property of being converted into lactic acid, and it is the formation of this principle which explains the acidity of milk and its spontaneous coagulation.

Thus, milk contains, 1, Non-azotised nutritious ingredients, as sugar, fatty matter; 2, An azotised ingredient, caseum; and 3, earthy and ferruginous salts. Its most characteristic principles are its caseum, sugar, and butter. It is a kind of emulsive combination of these principles. Some of its constituents are identical with, and others only slight modifications of, those of the blood.

The constitution of the milk varies very extensively. In the first place, it changes with its age; it is different before, during the time of, and after delivery. The colustrum is a yellowish fluid, consisting of a viscid part as thick as syrup, containing a great proportion of fatty matter, and a serous part, and it continues thus for three days after delivery. Ammonia renders the colustrum glairy or viscid, but has no such effect on pure milk. According to M. Donné, its microscopical appearance is very different from that of perfect milk; it contains milk globules, which are irregular and disproportioned, giving the notion of large oleaginous drops, or butter imperfectly elaborated. It also contains particles which have no relation to the common milk globule, of a yellowish colour, granular appearance, but slightly transparent, and composed, as this gentleman believes, of fatty matter and mucus. This state of the milk continues till the end of the milk fever, when it gradually ceases; but even in a state of health some trace of the primitive condition may be observed twenty-four days after delivery. Sometimes the milk, although perfectly healthy to the naked eye, may possess the character of colustrum for months, or during the whole period of suckling; or it may be produced by morbid states of the system; so that microscopical examination is indispensable to determine the healthy character of milk.

Every circumstance which alters the blood may alter the character of milk. Thus, its constituents differ according to climate, season, temperature, exercise, diet, and state of health. Homberg relates that the milk of Europeans who go to Batavia is liable to become so saline, that they cannot suckle their infants. It may be altered or vitiated in morbid states of the system. Sir A. Cooper records that the milk of a poor woman in ill health gave an eighth of cream, while nine parts of milk furnished three-and-a-half of cream in a woman highly fed. Merat relates the fact of a cow suffering under a tuberculous disease of the lungs, whose milk furnished on analysis seven times more phosphate of lime than ordinary. We can diminish or augment the quantity, and alter the qualities of the milk by the ingesta. Cruciferous, alliaceous, and bitter herbs communicate odour and flavour to it. Thus we can medicate it. Iodine, sulphate of soda, sesquicarbonate of soda, oxide of zinc, trisnitrate of bismuth, and sesquioxide of iron, have been detected in it after internal administration. At the same time, like the other secretions, it is not every substance which is separated from the blood indiscriminately by this emunctory. Sulphate of quinia, alkaline sulphurets, salts of mercury, and nitrate of potassa, could not be detected. Still, by administering mercury to the mother, syphilis is cured in the suckling. Instances, again, are recorded, in which the milk became truly poisonous by the ingestion of poisons, both mineral and vegetable. In all these instances there can be no doubt that the blood is acted on primarily, and the milk secondarily, as regards each other.

When the secretion of milk does not take place at the usual period, or when it is suddenly interrupted, the lacteous principles remaining in the blood, or if it be not duly employed, and its principles reabsorbed into the blood, as in the case of urine, of bile, and, probably, of every other secretion, it produces peculiar symptoms, and causes diseases to assume peculiar forms. Andral quotes the case of a female in good health, who had her milk suddenly suppressed by fright eight days after delivery. Fever ensued, which degenerated into a certain form, and, at the end of three weeks, anasarca and ascites occurred. Three weeks after this a bucket of fluid was drawn off, which resembled whey, had an acidulous odour, and afforded a substance resembling caseum. Six weeks afterwards a fluid was drawn off, greenish yellow, without the least trace of caseum, and the patient recovered.

Dr. Golding Bird has lately published a paper on the urine of pregnant females. It

had been asserted by continental chemists that it contains a new principle, to which the term *kiestien* was applied. It was examined by Dr. Bird in thirty cases. Half a pint, made early in the morning, was placed aside in a glass cylinder, covered with brown paper. It was found, after two days' repose, to have become much troubled; innumerable globules, presenting a greasy or fatty aspect, appeared on its surface; in two days more it became completely covered with a pellicle, resembling that which forms on mutton broth when cooling; and on the sixth day this crust broke up, and fell to the bottom. The pellicle occurred after two or three days' exposure in all the above cases, with three exceptions. When very thick, it frequently gave out the odour of putrescent cheese. None of the specimens were coagulated with heat, nitric acid, or acetic acid, and therefore could not contain albumen or caseum, although the animal matter was more nearly allied to the latter than to any other principle. Ammonia invariably produced a dense precipitate of earthy phosphates, indicating their excess. Submitted to the microscope, the pellicle exhibited beautiful triangular prisms of triple phosphat of magnesia, contained in a mass of granular matter, and here and there patches of tolerably regular globules. Dr. Bird found in several cases, that when the excretion of milk was arrested by the death of the child, or other causes, its elements, in similar combinations, found their way into the urine; and he has applied his knowledge of this character of the urine of pregnancy to the detection of the existence of that state in doubtful cases, with the most complete success. He has observed this effect of pregnancy on the urine as early as the second month.

The suppression of the menses, the increased proportion of fibrin (Lecture 3), the buffy coat, the change in the qualities of the urine, the secretion of milk, the signs, symptoms, and diseases of pregnancy, show that the blood is altered in its qualities as well as in its distribution, as a consequence of conception.

These, Gentlemen, are the principal *secretions*, or the *fluids*, which are secreted and excreted from the blood. The saliva, gastric, pancreatic, and intestinal juices, and some of the principles of bile, serve the purpose of preparing the aliment and promoting its conversion into chyle. The thymus, mesenteric, and lymphatic fluids, produce some essential change in the lymph; the portal blood is changed in its passage through the liver. The chyle, lymph, and portal fluid, are mingled with the venous blood, and all mutually re-acting upon each other, are conveyed to the right cavities of the heart, are propelled through the lungs, subjected to the influence of vital air, and, undergoing the most remarkable metamorphosis, are converted into arterial blood. Special contrivances are adapted, not for the formation alone of arterial blood, but for maintaining it in a state of purity. It is propelled rapidly through the kidneys, and again brought under atmospheric influence in the skin, over the whole surface of the body. Every injurious excess of oxygen, hydrogen, carbon, and azote, of water, animal compounds, and salts, every foreign substance unsuitable for assimilation, every effete material is separated, molecule by molecule, by one emunctory or the other. All these processes duly effected, thus formed and depurated, it is suitable for the nutrition of the individual, and the preservation of the species. It furnishes the seminal and other fluids conducive to reproduction, the milk for the nutrition of the infant, and the elements, and in many instances the constituent principles, in a very advanced state of formation, of the bones, muscles, nerves, fat, and of all the solid organic structures. Thus the individual lives and grows, and health and stability are maintained by the arterial blood, and by the arterial blood the species is perpetuated.

The blood furnishes the materials of nutrition, and since its corpuscular part does not leave the vessels, we must look to the liquor sanguinis as their source. Every thing respecting the minute construction of the organic fabric has been hitherto conjectural, but the investigations of Schleiden and Schwann, to a certain point, have thrown light upon this abstruse subject. It appears that all new-forming tissues take their origin from a fluid; those of vegetables from a liquid gum or vegetable mucus; those of animals from the liquor sanguinis or its analogue, after transudation from the capillary vessels. This substance, in a state fully prepared for the formation of the tissue, is called *intercellular substance*, or *cytoblastema*. It exhibits in the first instance minute granular points; these grow and become more regular and defined from the conglomeration of the minuter granules around the larger, constituting *nuclei*, or *cytoblasts*, having when fully formed, and in fact formed before them, one or more well-defined bodies within them, which are called *nucleoli*. From cytoblasts *cells* are formed. A transparent vesicle grows over each and becomes filled with fluid, this gradually extends and becomes so large that the cytoblast appears like a small body within its walls. The form of the cells is first irregular, then more regular, and ultimately flattened by pressure against each other, assuming different forms in different tissues. This is the description of vegetable cells, from which all the tissues of plants take their origin. Just in the same way the tissues of animals are formed from a fluid, in which first nucleoli, then nuclei

or cytoblasts, and then cells, are developed. 1. Lymph, pus, and mucus globules, are cells with their walls distinct and isolated from each other. 2. Horny tissues are cells with distinct walls, but united into coherent tissues. 3. Bone, cartilage, &c., are formed of cells whose walls have coalesced. 4. Cellular tissue, tendon, &c., are cells which have split into fibres. 5. Muscles, nerves, and capillary vessels are cells of which both the walls and cavities have coalesced. The cytoblastoma, or substance which affords the matter for the formation of cells, requires a constant supply of nutritive matter from the BLOOD.

It appears that the component matter of the cells differs from that of the intercellular substance; accordingly the cells must have a vital power by which they not only attract, but change the substance brought into contact with them; and, without attributing to them the higher functions which are possessed only by the entire animal organism, they have an independent organic vitality,—a power of "self-nutrition;" and, accordingly, "nutrition and growth depend not on a power residing in the organism as a whole, but on the endowments of the individual cells."

For more full particulars of these discoveries I must refer you to the last number of the "British and Foreign Review." I cite them on the present occasion for the purpose of showing how completely the nutrition of the body is dependent on the blood. How much the blood has to do with the "endowments" last mentioned, and how little the nerves have to do with it, Dr. Sharpey's experiment will go far to illustrate. The reproduction of a portion of the tail of a salamander took place, although it was cut off after the organ had been completely paralysed, by dissecting out, at its root, a portion of the spinal cord, together with the arches of the vertebræ. Hypertrophy, atrophy, induration, softening, ulceration, the conversion of one tissue into another, scirrhus, encephaloid, tubercular disease, &c., are so many modifications of nutrition and secretion. Seeing that "the growth of morbid structures is regulated by the same general laws which regulate the nutritive process in a healthy state," we shall ultimately, I doubt not, refer the whole of these diseases, by common consent, to the BLOOD.

ATROPHY OF THE UTERUS.—Dr. Kennedy exhibited a remarkable specimen of the atrophy of the muscular structure of the uterus, the organ of which was quite diaphanous; it likewise contained a polypus of considerable size. The preparation was taken from the body of a woman aged 45, who had borne several children.—*Dublin Patholog. Society.*

ON THE

TREATMENT OF CONVULSIONS

OCCURRING

DURING LABOUR,

WITH AN ILLUSTRATIVE CASE.

Read before the Medical Society of Manchester.

By JOSEPH A. SMITH, *Esq., M.R.C.S.*

THE process of parturition is usually marked by few deviations from its well-ascertained and ordinary phenomena; and although popular prejudice and sympathy have generally associated notions of peril with the interesting hour of travail, yet the slightest reflection will convince even those who are comparatively ignorant of the details of labour, that the hazard of life has not been wantonly appended to the discharge of that important process. The few cases of difficulty, or of imminent danger, occur as deviations from a general law, and are to be viewed as anomalous exceptions to the rule, which, if not permitting the absence of some suffering, at least is consistent with a general assurance of safety.

Very contradictory statements have been made by systematic writers as to the number of cases of *preternatural* labour which occur in a given ratio. Some of these registers have been transcripts of hospital practice; others, compiled from the private memoranda of individual practitioners. Thus, Dr. Hagen, of Berlin, states, that out of 350 instances he found it necessary to have recourse to the forceps 93 times; to the crotchet, 28. Twenty-six of this series died. Dr. Dewees, of Philadelphia, reports, that in more than 3000 cases he has *not met with one* requiring the use of the crotchet. Similar, though not equal, discrepancies might be cited. Our own experience, our familiarity with the practice of friends, and of others, strongly induce the conclusion, that improper and unnecessary interference may fairly be noticed as the baneful yet prolific source of these *unusually* disastrous records.

Deviation from the ordinary process of parturition may be studied under a twofold aspect. There are forms of danger and difficulty, of which only the well-instructed attendant can take cognizance—presentation of the funis, for instance, or malposition of the fœtal head. There are others which are external in their manifestation, instantly evident, and appealing to the observation of the most ignorant bystander. Among these, hæmorrhage and convulsion claim our especial attention.

My present object is the discussion of the question *as to the justifiable application of the long forceps, or the adoption of other modes of artificial delivery, in cases of convulsion occurring during labour at the full period of gestation.* What is the precise condition

imperatively demanding interference; and within what latitude of description (adopting such predicament as the extreme instance) ought the surgeon to confine himself in the formation of a class of cases to which instrumental or other aid is applicable?

Convulsion is an abstract term, the aggregate expression of results, not of the pathological condition constituting the cause of deviation from ordinary action. Deficiency of circulating blood may produce such condition equally with an overgorged state of the cerebral vessels; hence the absurdity of prescribing for mere symptoms, without reference to the *varying* and even opposite causes on which they not unfrequently depend.

In an essay on Puerperal Convulsions, published in 1818 by Dr. Dewees, the division adopted is—the *epileptic*, the *apoplectic*, the *hysterical* forms of the disorder. In apparent confirmation of the correctness of this arrangement, Dr. Merriman has observed that "the cases that alone are deserving of the appellation of *puerperal convulsion*, which have fallen under his observation, have borne a *very exact resemblance to the epilepsy*."

Resemblance is not necessarily identity. Satisfied that there is no essential difference between the two, so far as is appreciable by differences in the more or less important and prominent symptoms,—if the treatment of epileptic paroxysms were well and thoroughly understood,—there would remain no occasion for further or present inquiry. The application of a general principle would ensure the correct treatment, not only of the ordinary forms of convulsion, but of that mere modification of the disorder, as witnessed during labour. But have we, upon the slender datum of resemblance, warrant for the institution of such analogy? Imperfectly as the pathology of all disorders of the nervous system is at present understood, is it not highly unphilosophical (to say the least of it) to confound or blend in its definition one disease, of which we know essentially little, with another, of which our knowledge is still more limited? If the division adopted above be deserving our serious consideration, if any definite significancy attach to words, we are compelled to conclude, that if puerperal convulsion be not absolutely identical with epilepsy, the two pass into each other by gradations that are insensible; or at least, that if the assumption be not strictly true, it forms an extremely close approximation to exact definition. Is it true that puerperal convulsion is a mere modification of epilepsy,—that it is nothing more than a paroxysm of this latter obscure affection occurring accidentally, or as excited by some internal or peculiar irritant during labour, in the same way as it has been speciously and plausibly contended that there is nothing essentially peculiar in puerperal fever,—that this is nothing more than ordinary fever of the typhoid type occurring incidentally, and perhaps somewhat modified by the parturient condition? Is it also certain that hysteria occurs during labour, in the same relation? Has dissection confirmed the views of those who have contended that puerperal convulsion is apoplexy? If these questions were answered in the affirmative, the inquiry would still return—What, then, is epilepsy; what is the precise character of that deviation; *what the pathological predicament on which the symptoms depend?*

It may be urged that these researches would be found in practice more curious than useful, that the symptoms denote something, which if not denominated epilepsy bears at least (so far as external indications can point its true character) a close resemblance to it; and further, that the remedies which experience has demonstrated to be safe and useful in the one instance, have been freely recommended in the other. Even this is not wholly true; but if, for the sake of argument, it be admitted, at best such reasoning is idle, unscientific, founded on analogies that will feebly bear a close investigation. The question as to the propriety of manual or instrumental interference with the loaded uterus during convulsion, can only be decided by having reference to a closer scrutiny than seeming resemblance between two forms of disorder can supply, of which little or nothing more is known than participation in a symptom common to many forms of irritation of the nervous system.

Irritability of the uterus from distention has been ranked by the highest authority as one of the exciting causes of convulsion. If this be true, then blood-letting may prove a rather questionable remedy; the effects of sudden and very copious depletion closely following an unconscious and large expenditure of sensorial power, may be incorrectly chargeable upon careful removal of the contents of the uterus. I am inclined to think that in those cases admitting of relief from the lancet, the removal of a *moderate* quantity of blood is all that affords the hope of success, further depletion being decidedly injurious, and falsifying our diagnosis as to the seat and nature of the irritation. Recurring to the valuable published lectures of that able and distinguished physiologist and accoucheur, Dr. Blundell, I find him remarking—"Should you ask me in what manner these convulsions are produced, I should reply, that the more probable and immediate cause of them is a pressure on the brain, and perhaps on the spinal marrow also. This pressure results sometimes from an effusion of blood, still more frequently from effused water, and most frequently of all from mere congestion. If you were to ask me, How is it that these congestions of blood are produced? I should reply, not, in

most instances, by general plethora, but rather from an increased action of the cerebral vascular system, the carotid arteries, and perhaps the vertebral; indeed, in the adult, if we examine the carotid, we may sometimes see the pulse beating and jumping in the neck. Whether," he observes, "men are but children of a larger growth, I do not stay to inquire; but I am sure that women are—at least in constitution. Now, that the convulsive and hydrocephalic affections of young children are connected with an increased action of the cerebral vessels, is certain." Truly, idiopathic inflammation of the brain or of its investing membranes, is of frequent occurrence, still I think it can be rendered evident that the source of convulsion during labour is as commonly to be found in the uterus, as are some forms of hydrocephalus traceable to irritation of the intestinal mucous lining. The analogy is surely as fair as that which presumes the identity of puerperal convulsion, epilepsy, apoplexy and hysteria.

The existence of a class of convulsive cases, in which the symptoms are clearly referrible to uterine irritation, does not supersede the possibility of such irritation being sometimes seated primarily in the nervous centre itself. Careful observation will enable us to discriminate accurately between the two cases. The effects of remedies, more especially of the abstraction of blood, ought assiduously to be watched, and if the ordinary methods of subduing cerebral excitement be adopted unsuccessfully, a fair presumption is thereby afforded that the source of the mischief is not located within the head; that some distant, unremoved irritant is defying the lancet, or rendered more destructive, as the energies of the system sink under efficient depletion.

Professor Burns thinks that "puerperal convulsions are quite different from epilepsy, inasmuch as they recur at no future time, except perhaps in a subsequent pregnancy. The principal difference, and one of a highly important nature is, that whilst the *symptoms* are the same in both diseases, they arise in epilepsy from some organic affection of the brain or *direct irritation of that organ*, whilst, in the case in question, they rather depend upon some *sympathetic* and *temporary* cause." Nothing can afford so just an illustration of the conjectural character of the art of medicine as the extreme diversity of opinion prevalent amongst our highest authorities, not merely in reference to purely speculative questions, but in relation even to practical matters of the highest import. I apprehend there are few practitioners unbiassed by prejudice, and unfettered by preconceived opinions or a slavish subservience to some favourite authority, who will refuse their assent to the distinction now sought to be enforced, or deny that it ought most materially to influence our practice. The parturient condition of the uterus is carefully to be recognised. The accompanying irritability of the nervous system aggravates and disturbs still more completely the excited and distended organ; in this way convulsion becomes coexistent with uterine action, and though in many instances of a secondary character, has almost invariably arrested more attention than the forgotten yet primary source of the mischief, the condition of the uterus itself.

Under the influence of convictions such as these, I am glad to observe in Dr. Burns' work the after-admission, that "the patient is suffering from a disease connected with the state of the uterus, and that state is got rid of by terminating the labour." Few practitioners would resort to instrumental or manual interference in any instance without first having recourse on general grounds to the abstraction of blood; whether with a view of relieving cerebral congestion, or for the sake of rendering the uterus more easily accessible, either motive or both would secure and justify its adoption. Careful interference is not to be confounded with rashness or premature and unskilful efforts. If, with Dr. Hall, we have the requisite condition present or attainable, namely, an easily dilatable and yielding os uteri, if, after the lapse of as much time as the urgency of repeated and violent convulsion will permit, sensibility and consciousness are evidently waning, if the inefficiency of tolerably copious bloodletting have demonstrated the source of danger to be beyond its agency, if in addition to these precautions the intestinal canal has been thoroughly cleared, whether by injection or otherwise, and the head subjected to the evaporation of a cooling wash; then, indeed, the remark of Professor Burns becomes truly orthodox: "Delivery does not indeed always save the patient, or even prevent the recurrence of the fits, *but it does not thence follow that it ought not to be adopted.* I look upon it," says the learned professor, "as indispensable, if the convulsions are not checked by bleeding. In *almost all cases the forceps is requisite*, and turning is rarely required."

I attended, some time ago, a female in labour, whose case made a powerful impression upon my mind at the time; and I relate it, as involving principles of treatment in conformity with the principles just advanced.

CASE.

M. W., a plump, muscular young woman, about 24 years of age, sent hastily for me, in her second confinement. Before proceeding up stairs, I was informed that several hours had elapsed since the first accession of pain, and that the occurrence of convulsion, at first only trifling and transient, but afterwards of a more violent and alarming character, had excited the worst fears for her safety. I learned that the habits of the patient were irregular, and that she had

suffered much from mental excitement, consequent upon domestic inquietude. Armed with this information as to the probable predisponent and exciting causes of convulsion, I found her scarcely sensible, struggling with violent grasp, and purple-bloated features; her pulse, as the fits subsided, full, but not materially hardened; the teeth closed; the eyes rolling wildly, except for a few moments, when a disposition to sleep was suddenly arrested by a renewal of convulsive effort. In fact, the natural contractile efforts of the uterus seemed to pass into spasmodic contortion of the whole set of voluntary muscles; the tongue became bitten and protruded; the features assumed a hideous stare; and, as exhaustion and seeming stupor followed, the intestinal contents were unconsciously discharged. In this state of things it was my first anxiety to ascertain the precise condition of the neck and mouth of the uterus. On examination, I found it *freely dilated*, there was no tumidity of its lip, the head presented, the membranes were entire. *Moderate* depletion appeared advisable, not as a directly remedial agent, but as facilitating a further seemingly perilous and questionable step. I reflected that a condition very analogous in its appearance to permanent cerebral effusion or fatal engorgement, was rapidly approaching, and that if the removal of blood were the measure of the removal of irritation, the abstraction of the first twenty ounces would either embolden me to proceed, or preclude its further flow. Accordingly, the patient was bled. The convulsions became less energetic, but the intermediate stupor more decided. The uterine efforts entirely ceased. I waited four hours, but there was only a faint renewal of contraction, consciousness remaining entirely obliterated, and the pupil rapidly dilating. The breathing, too, became loud, slow, and noisy —a complete stertorous snore. I began to think seriously of unloading the uterus; the bowels had been well cleared, not naturally alone, but by a large terebinthinate injection; croton oil had been freely administered, and there had been time to denude the scalp of its hair, and to refrigerate the head with weak spirit wash. What was to be done? I could not warrant any inference from my first experiment, that a second bleeding was likely to be more beneficial than the first; certainly there was stupor in exchange for convulsion; how far the abstraction of blood had hastened that undesirable consummation is uncertain; at least if not absolutely prejudicial, it is but negative praise to say that the symptoms were not relieved by so powerful a remedial agent. Was it probable this apparently apoplectic condition would quietly pass away, and be succeeded by calm and natural effort? I could not reason myself into this belief, and so proceeded to artificial delivery.

I experienced not the slightest difficulty in slowly and cautiously effecting the full dilatation of the os uteri; I applied Dr. Haighton's long forceps to either side of the fœtal head, and separated from the mother a living child, which (the circulation through the funis being exceedingly weak) soon after died. *But the mother recovered perfectly.* Unconscious during the operation, she expelled the placenta at the usual period; no convulsion occurred after the removal of the contents of the uterus, she gradually regained sensorial power, and the further history of her case presented no uncommon peculiarities.

Most important are the pathological principles involved in the discussion of the general question. Enough, however, is constantly occurring to stimulate investigation, and despicable even in his own estimation must that man be, to whom confided is the life of helpless, trusting *woman*, who cannot feel the solemn obligation of renewed and deliberate inquiry.

25, Granby-row, Manchester,
March, 1840.

TREATMENT OF A SURGEON IN GENERAL PRACTICE BY SOME "CONSULTING" PRACTITIONERS.

Mr. D. O. Edwards, Surgeon, Chelsea, whom we know to be an able and highly respectable gentleman, has requested us to publish the following statement:—

Mr. Edwards operated successfully in a case of varus in both feet, on the 23rd of January last. The patient was able to walk well in the course of a month. He was a little boy about nine years old, the son of a poor widow named Vines, residing in Chelsea. He was seen after his recovery by a Mrs. Page, a laundress, who plies an extensive trade in the same neighbourhood, and who had a daughter with a distorted limb. Mrs. Page sent to Mr. Edwards to request he would call to see her daughter. He complied, and found Miss Page, a young woman 23 years of age, affected with atrophy of the right leg and thigh, and simple talipes of the right foot.

Mr. Edwards explained to Mrs. Page the nature of the affection, and undertook to restore the use of the limb by dividing the tendo-Achillis, and putting into regulated exercise the wasted muscles; so that, instead of being encumbered, as she then was, with a heavy iron apparatus to support her side, she need in future only wear a cork sole, of about an inch thick, to her shoe. Mrs. Page said she was perfectly willing that Mr. Edwards should perform the operation, but would like to have Sir James Anderson's assurance that it would

not injure her daughter's general health, that gentleman having attended her gratuitously for hysteria. Mrs. Page then inquired if the expense of the attendance would be great. Mr. Edwards, intending only to charge for the instruments, replied, the expense would be next to nothing.

Miss Page, carrying with her Mr. Edwards's card, waited on Sir James Anderson, a gentleman who had obtained from the vice-regal sword of Ireland, for private services, what is facetiously called the *honour* of knighthood. (It is a sad sign of the degeneracy of the present times, that this ancient gothic title should excite no more respect in the ears of the people, than the meanest monosyllable. Even Mr. Ewart of Liverpool, was so unenlightened as to consider the accidental contact of the royal blade as a great calamity, for when he beheld the fire kindling in the royal eye, that fount of honour, whence knighthoods emanate as thick as sparks from a furnace, and the shining brand uplifted, he exclaimed, with energetic pathos, "Not *me*, not *me*, your Majesty.")

Sir James Anderson having heard from Miss Page Mr. Edwards's opinion of her case, sent back by the patient a message to Mr. E., requesting him to call upon Sir James, at his house in New Burlington-street. Mr. Edwards was at that time affected with ophthalmia, which prevented him from attending to more than his most indispensable engagements. He yields to no one of his brethren in respect for the eminence which is attained by merit in every walk of life, but he knows how to distinguish a man of science from a professional *parvenu*. He did not comply with Sir James's request, because, as Sir James desired to derive information from Mr. Edwards, and not Mr. Edwards from Sir James, it was the business of the knight to call upon the surgeon.

A few days having elapsed after the transmission of this request, Miss Page called upon Mr. Edwards, and stated that Sir James Anderson wished her to take the opinion of Dr. Little, and she had called to know if he (Mr. E.) had any objection. Mr. Edwards said there was no room for two opinions in the case, but although it was quite unnecessary, he did not object to her seeing Dr. Little, or any other medical man. He then gave her his card, to be presented to Dr. Little, and desired her to repeat to that gentleman what he (Mr. Edwards) had said about her limb.

Mr. Edwards having waited two or three days, called upon Mrs. Page to fix the day for the operation, when to his extreme surprise that worthy dame placed in his hands a letter from Dr. W. J. Little to Sir James Anderson. In this communication Dr. Little, after giving an opinion of Miss Page's case, exactly tallying with that of Mr. Edwards, and favouring Sir James with some amusingly elementary and even infantile explanations, volunteered himself to perform the operation without condescending even to mention Mr. Edwards's name. That gentleman, feeling naturally indignant at this gross breach of professional courtesy, explained to Mrs. Page the indecorum of which Dr. Little had been guilty.

Immediately on his return from his rounds, Mr. Edwards wrote to Dr. Little, requiring an explanation of his conduct. To this Dr. Little sent a petulant reply, in which he stated, that although Miss Page presented to him Mr. Edwards's card, he was totally ignorant that Mr. E. intended to operate, and that a note which he had received from Sir James Anderson had led him to suppose that she was under the care of no one but Sir James. Inclosed in this letter of Dr. Little, was a copy of Sir James Anderson's note, in which not a word was said of Mr. Edwards's having undertaken the treatment. After perusing the whole of this statement, Mr. Edwards will leave the reader to determine whether this suppression of the truth was or was not disingenuous.

In consequence of this disavowal by Dr. Little, Mr. Edwards wrote to that gentleman exonerating him from all blame, and proposing, that, as some soreness had arisen from the discussion, his friend Mr. Weight, of Wokingham, who was an eminently successful operator in these cases, should take charge of Miss Page's foot.

After the closure of this correspondence, Mr. Edwards wrote, on the 17th March, a note to Sir James Anderson, requesting an explanation of the share he had had in the transaction. In reply to this demand Sir James wrote a most offensive letter, abounding in sophisms and evasions. He says, "My time is too much occupied to enter into a long detail on such a matter; suffice it to say, I never saw Dr. Little in my life more than Mr. Edwards, and could have no object in forwarding the views of either. Nor am I aware Dr. Little has any desire to operate on Miss Page, nor am I aware she is your patient. She has been under my care for some years, and still is so. The only message I sent to you was to say, that if you called on me I would hear your views, and then give her my advice."

Let it be recollected that this note was written *after* Sir James had received Dr. Little's letter, *volunteering* to perform the operation; and that Sir James was not charged with endeavouring unduly to promote the interest of Dr. Little. Mr. Edwards would not wait upon him like a lacquey, so a patient was *manœuvred* out of Mr. Edwards's hands into those of Dr. Little. The proceeding was well calculated to bring Mr. Edwards into discredit in his own neighbourhood. It is obvious that Sir James did not care for Dr. Little, ex-

cepting as a useful gentleman for his purpose. Sir James says that he was not aware Miss Page was Mr. Edwards's patient. In what light but that of Miss Page's surgical adviser, could he have considered Mr. Edwards, when he desired "to hear his views" of her malady?

But Sir James's truthfulness and candour are thrown out in fine prominent relief by the following passages of Miss Page's letter to Mr. Edwards:—

"When I saw Dr. Little I only stated your opinion upon the subject, and gave your card. I did not state that you offered to operate yourself, as I supposed Sir James had mentioned it in his note, and that Dr. Little was referred to merely for his opinion. Dr. L. said he wished to see me again. With this wish I made Sir James acquainted; to which he (Sir James) replied, that he supposed I had not informed Dr. Little that Mr. Edwards wished to do it. I said I had not, as I had expected he had mentioned it in his note. Sir J. then said, he should not know how Dr. Little understood it, until he heard from him."

In such a contingency, what was the plain duty of an honest man? what, but to rectify the error which his own negligence had occasioned?

Mr. Edwards wrote a second note to Sir James, complaining of the style and tenor of his reply. This note was opened and read by Sir James, and returned through the post-office, with the word "declined" written on the envelope. Mr. Edwards submitted this instance of refined intercourse between gentlemen to the consideration of a friend of approved judgment and spirit. The *referee* considered the act as indicative of excessive irritation on the part of the knight, but too ridiculous to excite resentment.

Mr. Edwards flattered himself that he could have acquitted Dr. Little of all share in the unworthy proceedings that have been related; but Mr. Edwards having been in very indifferent health for the last three weeks, finds that his patient has been tampered with in the interim. He was informed by a note that Dr. Little's concupiscence for the case had been again excited.

On the 9th instant Dr. Little wrote to him as follows:—"Miss Page has again called upon me, requesting me to perform the operation, stating, you have been mistaken in supposing she had consented that you should do it. I should be very happy to throw a case in Mr. Weight's way, but cannot in this instance, as in consideration of Miss Page being Sir James Anderson's patient, and of her urgent request, I have determined to divide the tendon (the smallest part of the method of treatment), and attend to the mechanical and other treatment myself."

Every gentleman who has read the foregoing statement will admire the cool assumption of this letter, and may smile perhaps at the oracular piece of information, that "the cutting is the smallest part of the operation."

Mr. Edwards instantly wrote a reply to Dr. Little's communication, refusing his consent to the performance of the operation, and stating that if Dr. Little persisted in his intention without the sanction of some eminent medical man, he should consider his conduct as inconsistent with common decency. Dr. Little has made no reply to this note, and therefore Mr. Edwards infers that he has performed the operation. * * *

The universal cry of the profession at these proceedings will be, *Proh pudor!*

Mr. Edwards has the documents referred to in the foregoing statement in his possession, and will publish them when necessary.

D. O. E.

15, Cheyne-walk, Chelsea,
April 14, 1840.

THE LANCET.

London, Saturday, April 25, 1840.

In again directing attention to the defects of Lord Ellenborough's Bill, and to the question of Vaccination, with the view of suggesting the principle of an efficient practical measure, we must ask,—What is meant by the "Extension of Vaccination?" To what extent has Vaccination been carried? To what extent should it be carried? And what machinery, or what general arrangements, are best calculated to protect the population, and to reduce the mortality by small-pox to a minimum?

No doubt can be entertained that a considerable portion of the population of the United Kingdom has never been vaccinated; and that many persons who have been punctured in the arm, and nominally vaccinated, have not had cow-pox. The precise numbers can only be ascertained by observation. It would encumber the census of 1841 too much to make this a head of inquiry; but it would be exceedingly useful to ascertain, in selected districts, at the time the census is made, the numbers that have had cow-

pox and small-pox, at each age; and the numbers that have neither been vaccinated, nor inoculated, nor had natural small-pox. Dr. BIGSBY has effected a census of this kind at Newark, and it may be accomplished in other parts of the kingdom, with the active co-operation of intelligent practitioners.

It would be tedious—and it is unnecessary—to state the grounds of the estimate; but we believe that from *five* to *six millions* of the population of the United Kingdom remain unvaccinated. Here, then, is ample room for the extension of vaccination. But it is not enough to ensure the protection of the population at one given time. The population is constantly receiving accessions; the annual births amount to about 950,000. If every individual that had not had small-pox were to be vaccinated to-day, in twelve months the number unvaccinated might be 950,000, *minus* the deaths, out of the 950,000 in the year.

At what age should vaccination be performed? The Appendix to the Registrar-General's Report (1839) shows that of 654 individuals who died of small-pox, 176 were under *one* year of age; 63 were under the age of six months. It is quite clear, therefore, that vaccination should not be deferred twelve months: it should be practised as early as three months, or earlier, in a place where small-pox happens to be epidemic. But, as a general rule, the *seventh* month—taking every thing into account—would be the proper period for vaccination. The danger from small-pox before that time is inconsiderable; and vaccination *may* then be a more decided and lasting protection than if performed in tender infancy.

Out of 950,000 infants born alive, not less than 150,000 perish in the first year, and, perhaps, 110,000 in the first six months. 840,000 survive, and require vaccination annually.

The time at which vaccination should be performed is not a matter of indifference; it should be fixed precisely. The uncertainty in which parents are left leads to procrastination; and it would probably be found, upon inquiry, that in many fatal cases small-pox seized its young victim before protection was deemed necessary; while, in others, the mother had deferred application to the vaccinator from week to week, because she had never heard any positive month fixed for the operation. They who have to act with the ill-educated are well aware of the importance of positive precepts.

The "extension of vaccination" implies, in the view which we take of the matter, the vaccination of every person living in the kingdom who has not had the natural small pox, or the vaccine variety of that affection; and the vaccination of the 840,000 infants who every year attain the age of six months: that is the extent to which vaccination should be carried in a rational community, under the auspices of an enlightened government. The chief obstacles to the extension of vaccination have been,—

The slowness with which the mass of the population adopt new measures of any kind, and the tenacity with which they cling to ancient prejudices:

The want of confidence in vaccination, as a protection against small-pox:

The procrastination of the operation, although its utility has been admitted:

The inability of the Poor to pay for vaccination:

The want of vaccinators, and of a regular supply of vaccine lymph, in certain districts.

The obstacles, it will be perceived, are of two kinds, and may be traced to two sources—the parents, and the vaccine agency.

The means that can be brought into operation to overcome these obstacles are numerous, and not inadequate; and cannot fail, if properly employed, to extend the advantages of vaccination to the entire population. A sufficient number of qualified medical practitioners exists in every part of the country. The deaths from small-pox are registered, so that an epidemic can never take a district by surprise. The births are not all registered; but it is to be hoped that the registration of births will soon be rendered compulsory and complete, or at

least that it will be sufficiently so to afford great assistance to the vaccinators. The Clergy, and all humane, intelligent persons may be expected to co-operate in promoting vaccination. The Directors of the Small-pox Hospitals and the Vaccine Institutions, may be rendered available, and more efficient. Dr. GREGORY has pointed out the facilities which the Penny-Post will afford for the transmission of vaccine lymph. The National Vaccine Establishment costs the country £2000 a-year; its constitution demands reform, and it may be rendered efficient by being removed from the deadly influence of the self-elective, irresponsible Corporations.

The slightest reflection must induce the conviction that the vaccination of 840,000 children, in every part of the United Kingdom, annually, cannot be effected with certainty without expense and trouble. But who would look at the trouble and expense, where the health of the people was concerned, when in the United Kingdom about 17,000 still die in every year of small-pox, and when it is considered that former governments of this country have loaded the people with a debt of eight hundred millions sterling in wars, ruinous, unjust, or unnecessary,—for the destruction of the human species,—and that the country now pays, to keep up the Army and Navy, £15,000,000 a-year! What good could not have been effected if a tithe of the immense sums expended by the nations of Europe in destroying each other, had been devoted to the improvement of the public health—to the amelioration of city architecture, and of the physical condition of the people—the dissipation of false prejudices, and the establishment of sound principles of knowledge in the heads and hearts of the young!

It is generally admitted that a part of the population—for instance, a *fifth*, or, including Ireland, probably a *fourth*—should be vaccinated at the public expense. The vaccination of this class of people must be performed by public officers. Some persons contend that the first step in the extension of vaccination should be the specific appointment of district surgeons, entrusted with the vaccination of the Poor. England has already been divided into districts by the Registrar-General; the vaccination districts might generally correspond with the Registrar's districts, and in England they would amount to about 2000. The vaccinators might be appointed by the parish authorities, the vestries, or the boards of guardians, as the case might be; they should possess the qualifications, and be guided by the regulations, of a central authority, to whom regular reports should be transmitted. The births and deaths registered by the Registrar of the district would be a check on their labours, and on the Reports which they might be directed to draw up periodically.

A better plan, probably,—one, moreover, which would meet with no opposition from the medical profession, and which would not fail to prove more advantageous, so far as concerns the display of zeal and activity,—would be to throw open the practice of vaccination to all legally-qualified medical practitioners, on equal terms, empowering Churchwardens and Overseers, and Boards of Guardians, to grant "orders" for vaccinating children in the respective localities of their parents, allowing the Poor to retain the "orders," and to select their own vaccinators from amongst the legally-qualified practitioners resident in the neighbourhood.

On producing proof of the performance of each vaccine operation, and presenting the aforesaid "order" to the proper authorities, at the end of every quarter, or every year, payment should be ensured to the operator.

Allowing the Poor to select their own practitioners would beget confidence in their minds, and probably do more than any other contrivance to promote the complete and final success of the scheme. The Poor now entertain an opinion, and one which is too often well-founded, that the most incompetent persons are forced upon them by Boards of Guardians and Poor-Law Officers.

The vaccinator should be paid a small

sum for every case, which he should see two or three times. The fee must be low. The medical profession will gladly make a sacrifice to promote vaccination; and the public would not pay a high fee for the Poor; at any rate, the demand of a high fee may considerably retard the spread of vaccination, by placing it in apparent opposition to the pecuniary interests of the rate-payers. We have made some inquiries on this subject. Half-a-crown has been named: the Guardians have in some unions paid eighteen-pence. The average rate should probably be *two shillings*: it may vary from 1s. 6d. to 2s. 6d., according to circumstances. A small fine, equal to the settled fee, may be deducted from the annual salary for every death from *small-pox* in the district.

Short tracts might be drawn up, and sent to every householder, explaining in a popular style the nature of vaccination. The danger of leaving the children unvaccinated should be pointed out to the mothers. They should be reminded of the thousands of deaths—of the children scarred and blinded by small-pox. They should be told that God and Nature have entrusted to their care not only the sustentation of their offspring, but their protection from the injuries and diseases of which infants have no idea; and that to leave them unvaccinated after the seventh month is almost equivalent to infanticide; for there is little real difference between causing death by violence or neglect, or strangling the babe, or leaving it a prey to mortal diseases. The Clergy should preach on the subject, for the advantage of little children; lectures might be given on vaccination at the Mechanics' Institutions; persons might be employed to go from house to house in low neighbourhoods, and to relate individual cases of bereavement from small-pox, and the neglect of vaccination. These measures should be brought into active operation whenever an epidemic prevailed or threatened.

The vaccinator should be, moreover, in communication with the central office, and have always on hand a supply of good lymph, and, if possible, two or three children under the influence of cow-pox. He should be bound to supply all the resident practitioners of the district with lymph; and it is desirable to have fresh lymph in every instance. The rate-payers and the higher classes would profit by this arrangement: their children might be vaccinated from the children for whose vaccination they paid.

Instead of the present inefficient "National Vaccine Establishment," a single Vaccine Commissioner may be appointed for England. He would carry the plan of vaccination into effect, and lay down rules for the performance of the operation, and for the Reports of the numbers vaccinated, with or without effect. The vaccinator should make an Annual Report of the numbers vaccinated by him, or by any other person in the district. For this purpose the Medical Practitioners should be directed to send him a list of the names of all persons whom they have vaccinated or revaccinated in the previous year. A comparison of this list, and the list which the vaccinator himself keeps, with the registered births and deaths, would show whether any remained unvaccinated.

The Commissioner would adopt measures to procure a constant supply of genuine vaccine lymph, and to distribute it through the country wherever it was required. The vaccinators would give timely intimation of any attempt to inoculate with small-pox matter, and the parties might be punished, as was judiciously suggested by the Marquis of Normanby.

The births and deaths are not yet registered in Scotland or in Ireland. Those countries may be divided into districts, and vaccinators may be appointed on the same principles as in England.

We shall not enter into further details, but we feel convinced that on this plan, with the modifications that may suggest themselves in the course of further discussion, the blessing of vaccination may be extended to the entire population of the United Kingdom.

Lord Ellenborough was, we conceive, actuated by good motives in introducing the Vaccination Extension Bill; but he has been misled by the Poor-Law Whisperers, who evidently suggested the provisions of that Bill, which sacrifices the vaccination of the people to the aggrandizement of an aspiring, ambitious, and incompetent Commission.

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1. *The Nervous System, Anatomical and Physiological, &c.; being the First Volume of an Original System of Physiology, adapted to the Advanced State of Anatomy.* By Alexander Walker. London: 1834. 8vo, pp. 704.
2. *Documents and Dates of Modern Discoveries in the Nervous System.* London: 1839. 8vo, pp. 172.
3. *Narrative of the Discoveries of Sir Charles Bell in the Nervous System.* By Alexander Shaw. London: 1839. 8vo, pp. 232.
4. *Outlines of Human Physiology.* By Herbert Mayo. London: 1837.

The connexion between mind and matter is almost as mysterious as that between time and eternity. The darkness of the grave is impenetrable to the human eye; even so are many of the mysteries of the nervous system—of that wonderful machinery "by which we live, and move, and have our being." Hence, no small share of glory is attached to any important discovery in the nervous system; and hence, as a necessary consequence, when the battle has been fought, numerous claimants present themselves to despoil of their honour those to whom belongs the real merit of the victory.

The recent history of certain discoveries in the nervous system furnishes an excellent illustration of this truth. A great victory had been won when it was established that "the functions of nerves correspond with their roots;" that "in the same nervous trunk there are often two distinct nerves of motion and sensation;" and, finally, that "the anterior columns of the spinal marrow are for motion, the posterior for sensation." The claimants to the honour of these discoveries have been numerous, but four alone now remain: they are, on the one side, Bell and Magendie; on the other, Walker and Mayo. The claims of the different parties are fully set forth in the works whose titles are prefixed to the present article; but we have not thought it right to hazard a judgment upon the testimony of witnesses, some of whom are prejudiced, others (we had almost said) perjured. We have, therefore, taken the trouble of examining all the *original* documents connected with the question which we are about to investigate, and we now proceed to lay before the reader a faithful account of our labours. The question, then, to which we shall confine ourself is—"To whom are we indebted for the discovery of the fact, that the nerves which proceed from the spinal marrow are endowed with the functions of sensation and motion, in consequence of their being connected, by distinct roots, with the anterior (motor) and posterior (sentient) columns of the cord?"

The most impartial mode of arriving at a solution of this question is to analyse, in chronological order, the opinions which have been successively published by Mr. Walker, Sir Charles Bell (and Mr. Shaw), M. Magendie, and Mr. Mayo. The evidence having thus been laid before the public, a few observations of our own, as a summing-up, will, we trust, be sufficient to settle this long-debated point, which nothing but the grossest misrepresentation, chicanery, and wilful falsehood, could have rendered doubtful.*

The first papers, in point of date, are those of Mr. Alexander Walker, published in the "Archives of Universal Science," 1809. Mr. Walker here clearly announces that "as, in some cases, sensation exists without volition, and as almost all nerves arise by distinct filaments, whenever a part, having both sensation and motion, is supplied from one nervous trunk, that trunk envelopes both a nerve of sensation and one of volition."

Again, reflecting on the arrangement of the fibres of the brain and spinal marrow, and also on the fact that sensation ascends to the brain, while volition descends from it, Mr. Walker concludes "that the anterior fasciculi of the spinal nerves are nerves of sensation, and the posterior fasciculi, nerves of volition" (motion); because it does not accord with the distinctness of natural operations to suppose that these motions, in

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* Whenever an author's words are cited, the passages extracted are marked by inverted commas.

opposite directions, take place through one and the same series of nerves.

In 1815, Mr. Walker lays down these two principles more distinctly, and concludes "that nerves of sensation arise in the organs of sense, and, by means of the anterior fibrils, terminate in the anterior columns of the spinal marrow.

"That those nerves of volition (motion) which do not arise directly from the cerebellum, spring from the posterior columns of the spinal marrow by means of the posterior fibrils."

Previously to the year 1822 Sir C. Bell published three memoirs, or papers, on the nervous system; viz., "The Idea of a New Anatomy of the Brain," in 1811; a paper on the nerves of respiration, in the "Philosophical Transactions," July, 1821; and another paper, on the same subject, in May, 1822. It is a curious circumstance, and one which we cannot avoid noticing at the outset of our remarks, that in no part of these three memoirs do we find the discovery of the motor and sensitive columns of the spinal marrow, or of the corresponding functions of the spinal nerves, *distinctly* announced by Sir C. Bell. Were these the only documents which we possessed, the claims of Sir C. Bell, as a discoverer, might, with some show of reason, be disputed; but, as shall presently appear, Mr. John Shaw supplies, in a more distinct manner, the evidence wanting in the writings of his master. With this preliminary observation we proceed to analyse the memoirs of Sir C. Bell, which only contain collateral evidence of the fact that to him we are indebted for one of the greatest discoveries of modern medicine.

The "idea of a new anatomy of the brain" was, as its name expresses, a germ—a simple sketch of the author's unmatured conceptions, sent forth in an unpretending form, for the purpose of soliciting the co-operation of other physiologists in a new field of investigation. In it Sir C. Bell treats of the whole nervous system; but almost every passage proves that, even at so early a period as 1811, he had seized the principle, which was afterwards to reveal a great discovery, viz. the necessity of investigating the functions of nerves through their roots—through that part of the central nervous system from which they seem to take their origin.

Sir C. Bell commences by showing that the brain is not a *sensorium commune*, as had been imagined, but that the cerebrum and cerebellum have different functions; and that the parts of the cerebrum have also different functions. He then demonstrates "that the nerves, which we trace in the body, are not single nerves possessing various powers, but bundles of different nerves, whose filaments are united for the convenience of distribution, but which are distinct in office, as they are in origin, from the brain;" and, finally, shows "that the nerves of sense, the nerves of motion, and the vital nerves, are distinct through their whole course, though they seem sometimes united into one bundle, and that they depend for their attributes on the organs of the brain, to which they are severally attached."

The celebrated experiments of Sir C. Bell on the nerves of the spinal marrow were originally instituted for the purpose of demonstrating the different functions of different parts of the brain. Sir Charles reasoned in this way: the cerebrum is continuous with the anterior fasciculi of the spinal marrow, the cerebellum with the posterior fasciculi; if, then, I can ascertain the functions of these fasciculi (through the roots of the spinal nerves connected with them), I can infer the functions of the parts of the brain in which the fasciculi terminate. This is evidently the germ of the future discovery, and contains its essential principle, viz. difference of function in the two roots of the spinal nerves dependent on their connection with different parts of the spinal marrow.

The passage in which Sir Charles Bell explains this view, merits quotation:—

"I took this view of the subject. The medulla spinalis has a central division, and also a distinction into anterior and posterior fasciculi, corresponding with the anterior and posterior portions of the brain. Further we can trace down the crura of the cerebrum into the anterior fasciculus of the spinal marrow, and the crura of the cerebellum into the posterior fasciculus. I thought that here I might have an opportunity of touching the cerebellum, as it were, through the posterior portion of the spinal marrow, and the cerebrum by the anterior portion. To this end, I made experiments which, though they were not conclusive, encouraged me in the view I had taken.

"I found that injury done to the anterior portion of the spinal marrow, convulsed the animal more certainly than injury done to the posterior portion; but I found it difficult to make the experiment without injuring both portions.

"Next, considering that the spinal nerves have a double root, and being of opinion that the properties of the nerves are derived from their connections with the parts of the brain, I thought that I had an opportunity of putting my opinion to the test of experiment, and of proving at the same time that nerves of different endowments were in the same cord, and held together by the same sheath.

"On laying bare the roots of the spinal nerves, I found that I could cut across the posterior fasciculus of nerves, which took its origin from the posterior portion of the spinal marrow without convulsing the muscles of the back; but that on touching the anterior fasciculus with the point of a knife, the muscles of the back were immediately convulsed. Such were my reasons for concluding that the cerebrum and the cerebellum were parts distinct in function, and that every nerve possessing a double function obtained that by having a double root. I now saw the meaning of the double connection of the nerves with the spinal marrow; and also the cause of that seeming intricacy in the connections of nerves throughout their course, which were not double at their origins." Pp. 50, 51.

Notwithstanding the decisive character of the passage we have just quoted, it must be confessed that Sir Charles Bell was, at this time (1811), unacquainted with the true theory of the functions of the spinal marrow. He, here, clearly attributes motion to the anterior columns of the spinal marrow; but seems to be in doubt concerning the seat of sensation. He experimented on the cord for the purpose of testing certain notions which he had conceived on the functions of the cerebrum and cerebellum, and, towards the conclusion of his pamphlet, shows that he had been led astray by theory. The functions of the cerebellum (and consequently of the nerves proceeding from it) he conceived to be "to unite the body together, and control the actions of the bodily frame; and especially to govern the operation of the viscera necessary to the continuance of life."

"The cerebrum (he regarded) as the organ into which all the nerves from the external senses enter, and from which all the nerves that are agents of the will pass out." Now, as the anterior and posterior columns of the spinal marrow (according to the views entertained by Sir C. Bell in 1811) derive their functions from their connection with the cerebrum and cerebellum, it follows that these functions (and consequently the properties of the nervous roots attached to them) must be the same as those of the two grand divisions of the cranial nervous system.

But although Sir C. Bell attributed both motion and sensation to the anterior columns of the spinal marrow, it by no means follows that he attributed the same properties to the anterior root of the spinal nerves, as Mr. Mayo falsely affirms in a passage* to which we shall presently refer. Were the latter assertion true, Sir C. Bell would have attributed two distinct functions to the same nervous filaments, and that in a paper, the whole scope and object of which were to prove, that whenever distinct functions are possessed by the same nerve, it is because the nerve is composed of fibres endowed with different properties and connected with different parts of the nervous centres. Instead of teaching that the anterior roots were, at one and the same time, nerves of sensation and motion, Sir Charles Bell distinctly asserted that they were compound roots, composed of filaments of sensation and filaments of motion, the latter being connected with the crura cerebri (medullary), the former with the cineritious matter of the hemispheres; the one passing *outwards* to convey volition, the other *inwards* to communicate sensation. But more of this anon.

From the year 1811 to 1821, Sir C. Bell did not publish any thing on the nervous system, but we are not to infer that he remained idle during this long period. His researches were continued without intermission; numerous experiments were performed on the fifth pair of nerves, in order to clear up certain points which the original experiments on the spinal marrow had left doubtful, and the progress made was indicated both in the public lectures of Sir C. Bell, and in several publications of his assistant, Mr. John Shaw. On the 12th of July, 1821, Sir C. Bell read a paper before the Royal Society on the nerves of respiration. He had intended "to lay the subject before the society in the precise manner in which it first presented itself to his inquiries, and to detail his observations and experi-

* Outlines of Human Physiology, p. 249.

ments in the succession in which they were made; but he had been persuaded by some of the members of the society to change that form to present the subject in the manner to which he had been accustomed in teaching." Although expressly devoted to the respiratory nerves, this memoir contains several facts and opinions which bear upon the present subject of inquiry. We have already stated that Sir C. Bell, being unable to determine satisfactorily by experiment the functions of the spinal nerves, turned his attention to the fifth nerve, which he classes with the spinal, in consequence of its arising by a double root (from the cerebrum and cerebellum), being at once a nerve of sensation and motion, and having a ganglion on the posterior root. These facts are pointed out in the memoir of 1821; while, on the other hand, the portio dura is described as a purely motor nerve, and having but one root, which is connected rather with the anterior than the posterior prolongation of the spinal marrow. So far, however, the evidence furnished by the writings of Sir C. Bell is merely inferential, and does not *directly* prove that prior to the year 1822 he attributed motion to the anterior columns of the spinal marrow, and sensation to the posterior columns. We therefore turn to the writings of Mr. John Shaw, his relative and assistant, who does not lay claim to any originality on the point under discussion, but simply professes to record the discoveries of Sir C. Bell. In his "Manual of Anatomy," published in Sept. 1821, Mr. Shaw draws attention to the pathology of the portio dura, "the use of which nerve had been illustrated by the facts of comparative anatomy, and by the various experiments instituted by Mr. Bell." Thus the portio dura was shown to be simply a nerve of motion, while the fifth pair was the nerve of sensation of the head, and conferred motion on the masticatory muscles. In the explanation of the plates attached to this manual, we find the following passage: "The principal arrangement is this; there is an obvious division of the spinal marrow, corresponding to the cerebrum and cerebellum; every regular nerve has two roots, one from the anterior of these columns, and the other from the posterior. Such are the fifth pair, the suboccipital, the seven cervical, the twelve dorsal, the five lumbar, and the six sacral. They are common to all animals, and are for the purposes of common sensation, and motion or volition."

Coupling this with what has been already advanced by Sir C. Bell, it is evident that the spinal nerves are distinguished, at their roots, into nerves of sensation and nerves of motion, connected with the anterior and posterior columns of the spinal marrow; but Mr. Shaw, like Sir C. Bell, has omitted to specify the particular relation between the anterior columns and motion or the posterior and sensation; he seems to take it for granted that every one is aware of their connection. The omission, however, is supplied by subsequent experiments and observations of Mr. Shaw. We have applied ourselves, with the deepest attention, to this point, and we are bound in justice to declare, that even the evidence of Mr. Shaw is merely inferential, that is to say, of such a nature as to force every physiologist to *infer* that motion was attributed to the anterior columns, and sensation to the posterior; but that he does not distinctly announce the principle; nor do we discover any experiment which clearly and directly established the true functions of the fifth nerve until the month of October, 1822, when Mr. Shaw divided the motor root of the fifth, near its origin, and proved that the masticatory muscles were, thereon, immediately paralysed. We have thought it right to dwell upon this fact, because it explains, in some measure, the pertinacity with which superficial observers and a few interested parties have denied the claims of Sir Charles Bell, and endeavoured to transfer the honour of his discovery to M. Magendie. But, although direct evidence be wanting, the whole train of Sir C. Bell's reasoning, and the observations of Mr. Shaw, clearly lead to the inference, that the former attributed motion to anterior roots, and sensation to the posterior roots, prior to the month of August, 1822. We shall quote one passage from Mr. John Shaw, in proof of this:—

"I shall take the liberty of trespassing still more upon the time of the Society, by making a few remarks upon a very curious question, which has particularly excited the attention of physicians in all ages, since the time of Galen—

"*Why sensation should remain entire in a limb, when all voluntary power over the action of its muscles is lost; or why muscular power should remain when feeling is gone?*

"The attention of Galen was particularly

directed to this question, in consequence of his having been called upon by some of his contemporaries to account for the manner in which he had cured a partial paralysis of the finger, by applications made to the spine. In answer, Galen told them, that two series of nerves went to every part: one, to endow the skin with sensibility; the other, to give the muscles the power of voluntary action. This opinion was probably founded on a mere theory; but the facts lately discovered, and the observations which have been noted in attending to the phenomena of disease, though they do not afford absolute proofs of the correctness of Galen's supposition, still go far to establish the fact—*that every part of the body which is endowed with two or more powers, is provided with a distinct nerve for each function.*

"The form of the nerves, which at the same time endow the skin with sensibility, and the muscles with the power of voluntary motion, is such, that they appear to be single cords; but if we examine the origin of any of these nerves, we shall find that it is composed of two packets of fibres, which arise from distinct parts of the spinal marrow. These origins are soon enveloped in the same sheath, so as to appear to a superficial observer to form a single nerve.

"It is not too much to suppose, that either of these origins may be affected while the other remains entire. To prove this by ocular demonstration will perhaps be impossible; and, therefore, the question will probably remain undecided. *But we have already seen examples of the consequences of injury to a nerve that has a single root, viz., the portio dura: for if we cut it, there will be only one set of actions paralysed; while by dividing a nerve which has a double origin, viz., the fifth, we shall destroy two powers, namely, voluntary motion and sensibility.* We know also, that when we cut through the trunk of a nerve going to the hand, we destroy both sensibility and the power of motion.

"In reference to this subject, I shall state the result of certain experiments which were made about thirteen years ago, by Mr. Charles Bell. The two sets of filaments by which each spinal nerve is connected to the spinal marrow, were exposed. On irritating one set, convulsions of the muscles on which the nerve was distributed, ensued; but when the other was excited, no perceptible effect was produced. These experiments we have often repeated, and always with the same results. But from the violence necessarily used in making them, it has been difficult to ascertain which of the filaments bestow sensibility on the part. It was easily shown, that if only the posterior set was destroyed, the voluntary power over the muscles continued unimpaired; but the pain necessarily attendant upon the performance of the experiment prevented us from judging of the degree of sensibility remaining in the part.

"It was, I believe, the result of these experiments which induced Mr. Bell to give an opinion nearly similar to that of Galen, in a short 'Essay on the Anatomy of the Brain,' printed and distributed among his friends in 1809.

"If the view which I have here taken of this question be correct, it may lead to this rule of practice. If only one set of functions of a spinal nerve be deficient, we should apply our remedies to that part of the system from which the nerve arises; but if both functions are impaired, we must then direct our inquiries to the state of the nerve in the whole course, from its origin to its distribution, as the loss of power is probably owing to some affection of a part of the nerve, after the two sets of filaments by which it arises are united together."—*Med. Chirurg. Society*, April, 1822.

In the above passage Mr. Shaw evidently cites the original pamphlet of Mr. Bell from memory, and connects it, in his own mind, with the progress which had subsequently been made in the physiology of the nervous system. It leads, if we understand any thing of the spirit of language, and of the subject under discussion, to the following inferences. Sir C. Bell attributed motion to the anterior roots of the spinal nerves, and proved the truth of his opinion by experiment. The seat of sensation, however, remained doubtful. To resolve this he examined the portio dura and the fifth nerves. On dividing the double origin of the fifth he destroyed both sensation and motion. Now as motion was shown to have its seat in the anterior root, it follows, as a necessary inference, that sensation was attributed to the posterior root (and posterior columns of the spinal marrow), because Sir C. Bell taught that motion and sensation could not belong to the same roots, and because he considered that the posterior roots of the fifth were continuous with the cerebrum, and through it with the posterior columns of the spinal marrow. A much greater number of facts might be assembled to sustain the justice of Sir C. Bell's claims; but we think it unnecessary to accumulate proof upon proof. For the present, we content ourselves with pronouncing a verdict in his favour, and shall, in a future number, dispose summarily of M. Magendie and his accomplice.

BRITISH MEDICAL ASSOCIATION, EXETER HALL.

Meeting of Council, April 14, 1840.

Dr. WEBSTER, in the Chair.

H. PHIPPS, Esq., 77, Hackney-road, was elected a member of the Association.

A letter was read from the Eastern Medical Association of Scotland, inclosing a copy of the following petition to the House of Commons:—

To the Honourable the Commons, &c. The Petition of the Members of the Eastern Medical Association of Scotland,

HUMBLY SHEWETH,—

That this Petition emanates from the Eastern Medical Association of Scotland, which is open to all regular practitioners, and at present consists of 74 members, physicians and surgeons, residing in the counties of Fife, Perth, and Forfar:

That your petitioners, feeling deeply the unsatisfactory state of their profession, and anxious to promote its respectability and usefulness, hailed with gratitude the inquiry ordered by your Honourable House in 1834, as a means of exposing the manifold evils which a want of a proper organisation has engendered:

That your petitioners are satisfied much mischief is occasioned by so many corporate bodies possessing the power to grant degrees and licenses to practise,—differing as they do from each other in the extent of education which they require, and in the titles and privileges which they confer; as also from their inability to protect the legally-qualified practitioners and the public from the pernicious effects of empiricism, which prevail so extensively in this country:

That the subject of medical police, and other matters relating to the public health, have not, in the opinion of your petitioners, hitherto received that degree of attention which *they* merit; and in consequence questions of great importance are frequently decided, in the Civil and Criminal Courts, upon evidence obtained from those who have not made suitable preparation for undertaking the responsibility necessarily devolving on the medical profession:

That as no controul is exercised over those who practise as chemists and druggists, many persons are employed in dispensing medicines who are not only ignorant of the qualities of drugs, but also of their proper doses, and who at the same time are in the custom of prescribing for diseases, with the nature of which they are wholly unacquainted:

That your petitioners are satisfied the true basis upon which a sound system of medical polity ought to be founded, is similarity of education, and an equality of rights, titles, and privileges among the members of the profession; and that the only way in which these can be obtained, is the establishment of a National Faculty of Medicine extending over the Three Kingdoms, which alone should possess the right of granting diplomas or licenses to practise for the future:

Your petitioners, with all due deference, beg to suggest that legislative interference has become necessary to obtain for their profession a sound legal constitution,—and this is the object for which the petitioners now address your Honourable House:

May it, therefore, please your Honourable House to pass such a measure as may unite and consolidate the various branches of the profession in the British dominions into one faculty or institute of medicine, having full power to regulate the education and government of the whole profession, and to confer equal rights and privileges upon its members; or to do otherwise in the premises as to your Honourable House may seem right.

And your petitioners shall ever pray, &c.

Extracts from two letters of Dr. Maunsell, of Dublin, were read, and also a series of resolutions adopted by the Irish Association respecting the presentation of petitions in the House of Lords.

A letter was read from the Stroud Branch of the Association, inclosing correspondence respecting illegal practitioners.

The President reported particulars of the deputation which waited on Mr. O'Connell, and which was kindly accompanied by Mr. F. French, M.P. The object of the deputation having been stated, viz., to ascertain Mr. O Connell's views of Medical Reform, the honourable member at once proceeded promptly to explain his opinions. He considered that though in general as much freedom as possible ought to exist in all matters connected with trade, commerce, and general professions, yet with respect to the medical profession, which was so intimately connected with the lives and health of the community, it was necessary that certain restrictions should be imposed, with the view of testing their education and qualifications; he looked upon medical men in a great measure as *guessing*, but then they ought to have the materials to *guess* with! With all deference to his excellent friends in the Colleges of Dublin, he thought that one presiding institution over the profession there, another in London, and a third in Edinburgh, would be amply sufficient, instead of the numerous bodies, with their separate and opposing interests, which now existed in various parts of the three kingdoms; that thereby uniformity as to qualification, privileges, &c., could be introduced, instead of the discord and want of unanimity

which at present prevailed, and that no ignorant candidate could be rejected at one college and allowed to pass at another, which he now understood to be the case. Mr. O'Connell went on to say, that he looked upon the present close and irresponsible corporations as the cause of all the evils which affected the profession, and that, therefore, the power of doing mischief must be taken from them; if they remained as at present, the seeds of mischief would still exist, and they would again spring up and grow; until, therefore, they were removed, nothing could be effected. On being asked if he would be disposed to take medical reform by instalments, he said, "Yes, if I could not do better, and the first instalment would be the removal of these numerous corporations." The deputation then expressed their pleasure at finding Mr. O'Connell so enlightened a medical reformer, and urged upon him the necessity of a representative governing body for the whole profession; in short, that every member should have a vote in electing their rulers. "O, very well," said the learned gentleman; "in fact, you want a little parliament for the profession; that will do, only the parliament must not have the powers of an Aulic council to oppress their brethren." It was replied, that that could not be, as the executive council or senate, or by whatever name it was called, being *elected* by the faculty at large, would be responsible to them. After explaining the views of the Association, and their outlines of a plan of medical reform, which had been adopted by many other large associations, the deputation withdrew, highly satisfied with the result of their interview, and much pleased by the frankness and courtesy of the honourable member.

On the above Report being laid on the table, Mr. SAMPSON said, he was glad to state that he had had a conversation with Mr. Vigors, M.P., who had expressed opinions nearly similar to Mr. O'Connell's.

It was moved by Mr. DAVIDSON, and seconded by Dr. R. D. THOMSON, "That a Petition be drawn up and presented to the two Houses of Parliament, praying them to enumerate the *sick* and *infirm* part of the population in the ensuing census, and that a Committee of three be appointed to draw up the Petition."

It was then resolved, "That a Petition be drawn up and presented to the Houses of Parliament, directing their attention to the fatality of small-pox and increasing epidemics all over the kingdom, praying the Legislature to adopt efficient means for the Vaccination of the entire population of the people of the united kingdom, and entreating the Parliament to be pleased to entrust the execution of the measure to competent persons well acquainted with the subject, and, therefore, to remodel that part of the 'Vaccination Extension Bill' which empowers the Poor-Law Commissioners to regulate the practice of inoculation, vaccination, and medical reports, as well as to annul or fix medical contracts."

By an inspection of the summary of the new law, given in THE LANCET of the 4th April, it will be found that the entire regulation of vaccination devolves upon the Poor-Law Commissioners, who, as in the case of the Poor-Law Amendment Act, have absolute power over the medical profession; it becomes then the duty of the Association, which has affected such important alterations in the Poor-Law Amendment Act for the benefit of the profession, to watch over their interests in this new measure of legislation.

The Council adjourned to the 5th May.

ROYAL INSTITUTION.

Friday, April 10, 1840.

ON THE FORMATION OF THE MOUTH, AND THE STRUCTURE OF RECENT AND FOSSIL TEETH.

By ALEXANDER NASMYTH.

Mr. NASMYTH commenced his lecture by a comprehensive and philosophical definition of assimilation, not as animal nutrition merely, but as that grand process by which all the changes of organic nature are continually being effected. He described this function as extending throughout the whole atmosphere, which was every where engaged in modifying vegetable juices in the leaves of plants, whilst the apparently inert crust of this globe may be said to perform no less a part in assimilation than that of being, as it were, a general stomach to vegetables. He dwelt at some length on the changes effected by the current of life from the lowest vegetable to the highest animal, showing how, in passing through all organic beings, it kept every particle of matter in almost constant motion, modifying perpetually their combinations, but without essentially altering, much less destroying, one of them. He alluded, in a striking manner, to the circumstance, that it is only after death has entirely removed the whole body of any animal from the sphere of vitality, that any part of it assumes a character of permanency or repose from incessant change. After this survey of the process of assimilation, the lecturer proceeded to consider its primary and essential organ—the mouth. In its most complex form, he said, the digestive apparatus was properly regarded as a development and extension of the buccal cavity, whilst, in its simplest form, it was nothing more than a rudiment of the latter. The various modifications of the mouth, in the scale of animal existence, and in conformity with the peculiar exigencies of the different classes, were next considered in a

very interesting manner, the lecturer dwelling particularly on the buccal apparatus of various fishes, and on the admirable machinery which the crocodile, shark, &c., for instance, possessed for seizing, holding, and tearing their slippery prey. The successive sets of teeth with which Nature has provided several fishes, were next alluded to. The whole of this part of the subject was illustrated by a great variety of valuable specimens. Activity and energy in any animal were admirably shown to be the necessary consequences of rapidity, and strength of assimilation. It was also very ingeniously remarked, that the character and habits of an animal were often most delicately indicated by the peculiarities of his mouth and teeth. In the human subject, too, it was stated, no healthy vigour of frame and constitution could exist without a well-formed, well-furnished mouth. The lecturer then quitted these more general considerations, and entered into a particular account of the teeth.

All teeth (he said) might be regarded as cones or wedges, of which there may be one or more in each tooth, more or less acute. The grinders of herbivorous animals, though approaching to a plane on the grinding surface at an adult age, were, nevertheless, at an early period, found to be composed of several wedges or cones, such as we see in the posterior convolutions of the tooth of the elephant: the front teeth being used like scissors were generally wedge-shaped; the canine, situated next the incisors, were generally simple cones, and were formidable weapons in the mouths of the carnivorous tribes and others. Interesting varieties of this species were the tusks of the hippopotamus, walrus, and several other animals. The grinders of the carnivorous races presented a combination of simple cones; in ruminating and other graminivorous animals they were convoluted throughout. Sometimes the teeth were composed of a series of cones or wedges bound together at their bases, as in the grinders of the elephant, in the beautiful little incisors of the flying lemur, and others. In some fishes, too, this peculiarity of form was beautifully shown. In many species of this latter class the mouth was provided with curious machinery, for the purpose of breaking down the hard shells with which their prey was surrounded; and this is the only true exception to the cone, or wedge shape, in the construction of teeth. These are arranged in the forms of pavements of different kinds. Before entering upon the composition of the teeth, the lecturer took a retrospective view of the whole subject. It has been observed (he said) that man may be regarded as fulfilling his destiny by means of his hand; but he considered that his mouth fulfilled a far more important part in his animal and intellectual life, for it is not only in him, in common with all other animals, the essential and original element of the apparatus of assimilation, by which his physical frame is built up from materials supplied by surrounding Nature, but it is also the organ of intellectual expression, without which he would not be able to take a single step in his mental career, but would remain lower in the scale of creation than the lowest brute; in fact, it was the organ for the communication of ideas, and the improvement of the mind. This duty which it performs is indispensable in the existence of the race, in the improvement of its condition, and the communion of social life. By its means the energies of the whole race may be said to be sometimes concentrated in one focus. It is a remarkable fact that no other conformation of mouth than that of man could admit at once of perfect articulation, and of a proper mastication of food. If it had been studded with teeth similar to those possessed by carnivorous animals, the deeply-serrated cutting surfaces would not have admitted of the free action necessary for articulation, and the flattened surfaces of the graminivorous animals would not have assisted him in masticating his animal food.

The constituents of teeth, the lecturer then observed, are four in number, and it is by their modifications that are formed the interesting and characteristic varieties which will for a short time occupy our attention, and some of which are here placed before you.

Let me first devote a few words to the development and organisation of the teeth. The teeth may be said to be formed by a reduplication of the mucous membrane of the mouth, called the pulp, which I have discovered to be composed of vesicles or cellules; ossific matter is deposited in the external layer of these cellules, and thus the ivory of the tooth is formed, which is hence neither more nor less than the ossified pulp.

I have long studied this interesting portion of animal development, which hitherto has hardly ever been even approached by anatomists, and I have been fortunate enough to find that the surface of the pulp, or that portion which may be called its formative portion, exhibits one of the most striking, although one of the most minute, beauties of organisation displayed in any tissue.

I have also been able to discover the ivory in a state of transition on this formative surface, examples of the appearances of which are now placed before you.

Of all the constituents of teeth, the ivory has been most studied, and longest known; yet on this subject hardly any two anatomists have agreed, from the time that Hippocrates taught that it was composed of hardened fat, down to Retzius, one of the latest and most remarkable writers on the subject, who states that it is composed of

tubes, and considers that the intertubular substance is unorganised.

I must confess that I have not as yet been able to satisfy myself as to the justice of all his conclusions; I have not succeeded in demonstrating to my conviction that the fibres of the teeth are tubular. On microscopic examination, I have, on the contrary, always found that they present a baccated or interrupted appearance, like rows of beads. I have also convinced myself that the substance between them is distinctly cellular, and not structureless, as he and his followers hold; and that it is not only distinctly cellular, but characteristically so in the different groups of animals. A few examples are now before you.

When the growth of the ivory is completed, the primary function of the pulp ceases; but its residue, I have often observed, ossifies under the influence of disease in different parts of its substance, and sometimes entirely.

The frequent occurrence of this fact, has led me to discover an interesting analogy of formation in the pulps of all animals. I have found that the internal portion of the pulp can exercise the function of ossific deposition altogether, independently of that which is carried on at the surface of it.

In this internal portion, in many of the inferior animals the residue of the pulp is observed (after forming a certain definite portion of regular ivory,) to assume a change of function, and to form a substance similar to that which occurs in other animals from disease. Interesting examples of the normal occurrence of this formation are presented by the teeth of the sloth family, of which the appearances presented by the fossil megatherium is very interesting and beautiful. It occurs generally in the teeth of all fishes, in the walrus, and many others; I have considered it worthy of being ranked as a distinct fourth tooth-bone substance.

The ivory of the tooth is often surrounded by a hard covering, which is called the enamel. This substance I have ascertained is distinctly cellular, and characteristically so in different animals, though this is in direct opposition to the statements of preceding writers. I have also been enabled to demonstrate that the tooth possesses an envelope which had escaped the notice of previous observers, and of which the functions are of considerable importance. A coating has been long noticed and acknowledged as most obvious, on the grinder of the elephant, where it fills up the spaces which would otherwise be unoccupied between the layers of enamel, cementing the whole of this convoluted compound tooth into one solid mass. It is to be observed in all teeth of this kind, which are required to perform the office of a grinding-stone, in pulverising the food; and this substance is provided, in order to fill up the interstices, and that there may be produced a succession of surfaces efficient for that purpose. The surface presents three substances in succession, differing in texture, hardness, shape, and disposition. The enamel is the hardest, and presents a beautiful undulating edge. The process of trituration wears down the ivory on the one hand, and the cement on the other, these being of softer texture than the enamel, and thus an irregularity of surface is necessarily produced. The cement being again a little softer than the ivory, a most efficient grinding surface is kept in constant order by the very act and habitual exercise of the function of mastication. This beautiful adaptation of means to an end is only a single instance of the design which is demonstrated in every part of the machinery of the mouth. On pursuing this inquiry, I found that this crusta petrosa is present in an attenuated state, and can be demonstrated in a great number of teeth, which have hitherto been considered as devoid of any covering at all, external to the enamel. Here it is in the human tooth, and in that of the ox.

No part of the animal frame presents so many definite peculiar varieties as the teeth. The bones of different classes of animals may vary to different degrees in external form, but will for the most part be found to present characteristic peculiarities of internal structure; whilst the teeth, on the other hand, seem to present in each class forms of internal arrangement proper to the individual class, and distinguishing it from others. From this point of view the importance of the teeth, to the naturalist generally, and particularly in the study of geology, becomes apparent; and it is with a few observations on this interesting relation that I propose to terminate the present discourse.

The modern science of geology may be considered the most comprehensive of all the branches into which human knowledge resolves itself. No progress can be made in any department of physical philosophy, which does not throw light upon its vast and wondrous domain, and exalt the brilliancy of its truths. Though it exacts a knowledge of the perishable portions of the animal frame, it is obvious that its advance chiefly depends on accession of information respecting permanent animal relics, which remain imbedded in the crust of our globe, unaffected by the powerful chemical agents contained in the laboratory of Nature. The skeleton, scales and teeth of animals, being the only parts which are found in a fossil state, it is evidently of paramount importance that their general character and internal structures should be clearly understood.

A slight investigation of the appearance of these textures by the microscope will amply reward the general student of Nature, and the geologist will be convinced of this interesting fact, that amidst the debris

and comminuted fragments of fossil skeletons thrown together chaotically, worn down, and totally defaced without one vestige remaining in any portion, however small, of an external indication, to serve as a mark of the frame to which the particular fragment belonged, or to help to guide us to a knowledge of the extinct races of the animated tenants of earth in antediluvian ages, he may still be enabled to demonstrate to perfect conviction that certain fragments are the fragments of teeth, and from examining these by the microscope he will be convinced that they must have belonged to animals of a certain order and conformation. Put in possession of this scrap of information, he can also further proceed to delineate the animal, in each particular case, in all its details, with a nearly mathematical degree of certainty. From this knowledge follows, necessarily, an idea of the country or locality in which alone the animal thus restored could exist; and hence, from the examination of minute, insignificant, and, to common observers, utterly worthless fragments of tooth-bone, from slight particles of crumbling matter, we derive the means of directly contemplating whole regions of the face of the ancient globe covered by its animal tenants; and, consequently, the various subservient animals and vegetables which these must have required for their support.

In my announcement of a work on this subject, part of which has since been published, I first brought under public notice, early in the year 1838, the application of these microscopic observations to the recognition of a new type, characteristic of the various forms of animal structure. The subject being of a very alluring and fascinating nature, has been eagerly caught at by several writers, and has been pursued with much scientific research and industrious collection of materials. It is a department of science which any one can readily appreciate by making a few microscopic sections, and testing them by means of a few simple rules.

Having been long engaged in the study of the treatment of the diseases of the teeth, I considered it my duty to investigate any novel doctrines which might throw new light upon maladies which are daily passing under my notice. And this duty, like all others which are executed with willingness and alacrity, I have found to be a source of unmingled pleasure, for in performing it I have not only been rewarded by arriving at a comprehension in many phenomena of decease which had been hitherto obscure, but I have been so fortunate as to establish results which are also of the greatest interest in themselves, and which constitute, I may venture to state, a considerable advance in this department of anatomical science.

WESTMINSTER MEDICAL SOCIETY.

Saturday, April 11, 1840.

Dr. Chowne, President.

NEURALGIC PAINS OF THE ABDOMEN AFTER PARTURITION SIMULATING PUERPERAL PERITONITIS.

Dr. Golding Bird detailed to the society the result of his observations on the nature and treatment of those severe neuralgic pains of the abdomen occurring after parturition, in women of nervous temperament, and the subjects of uterine irritation. These pains, from their severity, and from their being ushered in by rigors, followed by heat and sweating, were very likely to be, and often have been, mistaken for peritonitis—an error of immense importance, as the depleting and depressing measures generally required in the treatment of the latter disease were almost always injurious and even dangerous to patients labouring under the particular form of neuralgia in question. As a brief outline of the symptoms presented in these cases, it may be observed, that a woman previously the subject of uterine irritation, as shown by painful menstruation, leucorrhœa, or wandering pains in the hips, loins, and back, becomes pregnant, and passes through the period of utero-gestation tolerably well; labour ensues, and all does well for a space of time, varying from a few hours to two or three weeks, when from the slightest exciting cause, as, a few hours' constipation, the ingestion of some injurious article of diet, an arrest of any one of the secretions, but especially of the cutaneous transpiration, or a direct stimulus applied to the generative organs, a peculiar train of symptoms sets in, preceded by severe rigors, heat, and sweating, and consisting of intense pain over the abdomen, but especially about the uterine region, coming on in paroxysms every ten or fifteen minutes, or sometimes at longer intervals, causing the patient to scream out, and writhe in agony like a person in a fit of colic; excessive neuralgic tenderness of the whole abdomen being present in the absence of the paroxysms of pain. Slight delirium and intense depression of spirits mark these attacks; the lochiæ cease on their onset; the pulse is generally very rapid, but small, yet jerking like an hæmorrhagic pulse; the tongue variable, according to the state of the intestinal tube; the skin generally soft and moist; sometimes, although rarely, warm and dry.

The diagnosis of this disease from peritonitis is not very difficult, if attention be paid to the character of the symptoms. The occurrence of the pain in paroxysms, the inability to retain a fixed position in bed, the capability of supporting pressure on the abdomen when the patient's attention is arrested by an abrupt question, or her infant's cries, will generally serve to distinguish this neu-

ralgic affection from peritonitis. With regard to bleeding these patients in an upright position, to distinguish between neuralgia and peritonitis, Dr. Bird expressed his dissent from its approved value, as he had seen many instances in which patients labouring under uterine neuralgia had borne the loss of immense quantities of blood not only without fainting, but without immediate appearances of depression, although, in a few hours afterwards, the alarming state of depression which appeared, sufficiently indicated the injurious influences of the bleeding.

The treatment of these cases depends greatly upon circumstances; in general, supporting the patient by a bland and nutritious diet, application of very hot fomentations to the abdomen, the restoring whatever secretion appeared most deficient, and allaying the irritable state of the patient by sedatives, constituted the most important modes of treatment. Dr. Bird alluded to the great prevalence of this class of affections in certain districts, at particular times: during the last six months a large proportion of women, in the district of the Finsbury Dispensary, who were confined, became the subject of puerperal neuralgia of the abdomen, in a more or less severe form. This he did not attribute to any epidemic influence, but rather to a moral effect, produced by the prevalence of child-bed fever in the district, as in almost all the cases admitted under Dr. Bird's care at the Dispensary, some depressing effect produced by such an impression was very easily made out.

A discussion of considerable length followed the reading of Dr. Bird's paper; the subject, however, treated of in the communication, was, unfortunately, scarcely touched upon by the various speakers, so that, as Dr. Bird justly remarked, when called upon for his reply, he had nothing to reply to.

SIR ASTLEY P. COOPER, BART.

To the Editor of THE LANCET.

SIR:—A review of Sir Astley Cooper's splendid work, on the "Anatomy of the Breast," having made its appearance this quarter in the "Medico Chirurgical Review," dedicated "To the Members of the Medical Profession," I had hoped in this that some eminent member of the faculty would have duly returned the compliment, by recommending a public acknowledgment to Sir Astley, in the presentation of some lasting memorial of so great a man's fame. It is universally admitted that Sir Astley has done as much as, if not more, in the science of surgery, than any other man; and can the profession produce another instance of one of its members labouring hard for a period of fifty years in the cause of science, and that labour attended with the most happy results? Surely, then, the profession is in duty and in justice bound to offer some public testimonial, not only as a mark of the worthy Baronet's superior professional talents, but for his urbanity, kind-heartedness, extreme attention, and willingness to assist by his advice, the junior and less fortunate members of the profession.

When a man reaches the *jubilee* of science, if I may so express myself, and, even beyond that period, is assiduously dedicating his time in furtherance of fresh matter of usefulness, he merits every encomium that can be suggested. Provided that the profession will at once evince its respect, by coming forward and assisting in so noble a project, it would only remain for a Committee to be formed to carry the same into effect. I have the honour to remain, Sir, your very obedient servant,

JAMES WEEDING, M.D.

Hollesley, Suffolk, April 21, 1840.

[We take this opportunity of stating that, if we have not as yet noticed Sir A. Cooper's work on the "Anatomy of the Breast," it is because the publishers have thought right to depart from the usual custom, of forwarding copies to the public press. Sir A. Cooper's work, they say, is too expensive a one to be given away. *Tant pis pour lui.*]—*Sub-Ed. L.*

DINNER OF THE SOCIETY FOR THE RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN, &c.

WE are requested to direct attention, in this part of our Journal, to the advertisement of the Annual Dinner of this Institution, to take place this day, Saturday, April 25th. The advertisement will be found on the cover of the present number of THE LANCET.

DE BLAINVILLE'S LECTURES ON COMPARATIVE OSTEOLOGY.—In the next number of THE LANCET the publication of these unique papers will be resumed. The probable interruption of the materials, from the multifarious and pressing duties of the eminent lecturer, De Blainville, induced us to forego, for a time, the presentation of his researches to our readers, in connection with the requisite engravings, to such extent as his able editor and illustrator, Dr. KNOX, enabled us to supply. We are now fully provided against interruption in the series, and shall forthwith reproduce them.

TO CORRESPONDENTS.

Paupertas is referred, for the desired information, to the "British Medical Almanack."

An Indignant Licentiate, &c., next week.

The publication of Dr. Franz's cases, in another Journal, renders the insertion of *M. Steinhaeuser's* letter superfluous.